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FACTORS ASSOCIATED WITH THE DEVELOPMENT OF A METHODOLOGY FOR THE DISSEMINATION OF EDUCATIONAL INNOVATIONS: A REEXAMINATION

A Dissertation Presented

By

WILLIAM ROBERT THAYER

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

FEBRUARY 1981

School of Education

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Approved as to style and content by:

Dr. William C. Wolf, Jr., Chairperson of Committee

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Dedicated to my father - IRVING L. THAYER (1910-1968) -

whose character and example contributed greatly to this study.

ACKNOWLEDGEMENTS

The support, enthusiasm and guidance of many people contributed to the completion of this dissertation. First of all, I would like to thank the three members of my dissertation committee:

Dr. William C. Wolf, Jr. who first stimulated my interest in the field of educational knowledge diffusion and utilization and who supported my doctoral efforts in times and situations when the completion of this project seemed hopeless.

Dr. Albert Anthony who offered his support and guidance when it was especially needed.

Dr. Michael Gauger who sponsored my research efforts at a time that proved to be most crucial to the overall success of my work.

In addition to the members of my committee, I would like to acknowledge and thank the students and staff members of the JESI Alternative High School in Springfield, Massachusetts for their continued good humor in encouraging and sustaining my work over the past six years.

Most special thanks and appreciation go to Mrs. Vesta Powers who single handedly typed and set-up the final format of the dissertation. Her professional advice, editorial assistance, and encouragement were invaluable in the completion of my work.

And finally, to my wife, Paula, and my son, Justin, for supporting and loving me through all the craziness, frustration, elation and the myriad other emotions and problems that seem to go with the writing of a dissertation. And also to my mother, Harriet A. Thayer, who has stood by

me throughout the years and helped me to reach for those goals I never believed I could achieve.

ABSTRACT

FACTORS ASSOCIATED WITH THE DEVELOPMENT OF
A METHODOLOGY FOR THE DISSEMINATION OF
EDUCATIONAL INNOVATIONS: A REEXAMINATION

February 1981

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Research methodology inspired by a so-called "classical diffusion model" drawn from USDA's Cooperative Extension Service - which is a significant part of the fabric of probably all known diffusion research traditions - doesn't seem to generalize across contexts and across disciplines as well as authorities previously believed. For example: a recent report issued by the World Bank and a report of a workshop on diffusion research recently held at Northwestern University both highlighted limitations of the model; and, four recently-completed dissertations directed by Wolf raised serious questions about the stability of diffusion generalizations across disciplines.

Since a recently-developed tool designed for linkage agents - called the Wolf-Welsh Linkage Methodology - is rooted in twenty-six generalizations drawn from the pool of inter-disciplinary know-how, and since the generalizability of this know-how within educational contexts may be suspect, more is needed to be learned about the generalizations.

The generalizations are derived from a theoretical linkage configuration conceptualized by Wolf in the early 1970's. The configuration

included four antecedent variables, one manipulable variable, and three outcome variables. The theoretical configuration provided a frame of reference for the organization of empirically-verified generalizations about the linkage phenomenon which were gleaned by Wolf, Welsh and others from the multi-disciplinary literature. The Wolf-Welsh Linkage Methodology is based upon twenty-six of these generalizations: five relate to the linkage agent; three relate to conditions for change; seven to the innovation; five to the targeted audience; four to linkage modus operandi; and two to outcomes.

A systematic analysis of completed educational research was carried out which related to each of the twenty-six generalizations. A comparison was made to determine similarities and differences between what researchers have reported about linkage across disciplines on the one hand and what researchers have reported about linkage within the discipline of education on the other hand.

Outcomes of the comparative analysis were framed by three major questions related to the generalizability of multi-disciplinary diffusion research to educational linkage enterprise:

1. Are there linkage generalizations, based upon research completed in disciplines other than education, which can be legitimately utilized within varied educational contexts?
2. Are there linkage generalizations, based upon research completed in disciplines other than education, which should not be utilized within varied educational contexts?

3. Are there linkage generalizations, based upon research completed in disciplines other than education, which should be - but are not being - utilized within varied educational contexts?

Results of the analysis uncovered that empirically-based educational research made up a small portion of all the documents analyzed. Most of the material was of a theoretical nature, an anecdotal nature, or a non-empirical case study nature. Not enough empirically-based educational research was uncovered to carry out a meaningful study of similarities and differences between what seems to be known about linkage across disciplines and what seems to be known about linkage within education.

Perhaps the most powerful outcome of the investigation is documentation that educational researchers have not produced much empirical know-how about linkage phenomenon yet. Some information and direction for future research in order to address the generalizability and completeness of educational linkage know-how is highlighted.

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CHAPTER I

Orientation

Social change is occurring. As these changes accelerate, existing social institutions - educational, medical, agricultural, and industrial - must develop the capacity to manage change. Although much has been said and written about social change, our scientific understanding of the process of change has advanced little. Research continues to generate and test new data in order to understand and manage the change process. Theories and strategies abound. Unfortunately, despite such efforts, successful change enterprise remains an art form which few can master.

In recent years, much concern has been shared via speeches and the printed word about the process and the product of American educational systems. Rapid social change demands an institutional capacity to respond expeditiously. In particular, America's educational systems lack the capacity to react, either rapidly or slowly, to accelerating social changes.

Education's research community has not yet learned how to cope with most of the problems and causes of problems associated with accelerating social changes. It is not surprising, then, to discover few solutions to such problems within the educational research literature. Rogers and Shoemaker (1971) remark:

> One of the larger traditions in terms of number of studies, education is one of the lesser traditions in terms of its contributions to understanding the diffusion of innovations or to a theory of social change (pp. 57-58).

In an effort to understand the process of educational change, social scientists have concentrated on communication roles and processes - particularly the communication of innovations. Havelock (1969) offers the communication formula: WHO says WHAT to WHOM by WHICH CHANNEL to WHAT EFFECT for WHAT PURPOSE in order to provide a starting point for tackling the general problem of educational change (pp. 1-11). At present, only parts of Havelock's formula appear to be known. Specifying, measuring, testing, systematizing, standardizing, and operationalizing the formula is a formidable and frustrating endeavor. Controversy exists as to which factors are essential and which are peripheral to the communication of educational innovations.

Left alone, change occurs everywhere, in varying degrees, for different purposes and with many diverse consequences, both good and bad. Since the 1940s, education's research community has attempted to accumulate pieces of the puzzle in order to understand the key correlates of educational change. Paul Mort and his associates at Columbia University established that the diffusion of innovations precedes at an extremely slow pace (decades). The diffusion is very slow at first and then speeds up for a couple of decades, and then in cyclical fashion, slows down again. Mort (1964) writes:

> Early studies of diffusion reveal that educational change comes about through a slow process and follows a predictable pattern. Between insight into a need and the introduction of a specific way of meeting that need for general acceptance, there is typically a lapse of one-half a century (p. 318).

Analysis of diffusion rates in this century compared with the latter part of the 19th century indicate a 20% increase in tempo, however (Mort,

1964). Evidence submitted by Carlson (1965) further highlights a "speed-up" of diffusion rates in education.

Thus, one hopeful fact has emerged from research and development work; that the "lag" often reported between invention or creation of a new product, practice, or idea and the time it takes for such information to diffuse through educational settings and be employed by practitioners is shortening.

Despite such progress, most researchers agree that education lags woefully behind other fields (medicine, agriculture, and industry) in its capability to diffuse (i.e., spread) and utilize (i.e., put into effect) new information. Activities conducted within educational systems exhibit a decided gap between what is known and what is being done.

Ideally, the process of diffusion accounts for the spread of validated information from sources of invention (regional educational laboratories, universities, think tanks, publishers, or individual researchers) to practitioners. The effective linkage between knowledge producers (i.e., researchers) and knowledge users (i.e., practitioners) accounts for the institutional capacity to respond expeditiously to accelerating social changes. The continued failure of America's educational systems to effectively "close the distance" between research and practice has been well-documented within the research literature. Wolf (1975) states:

> Analyses of fields that are routinely influenced and modified by scientifically derived information provide clues to the essence of their success. These fields try to incorporate all or part of the following practices:
>
> 1. A network of respected, believable knowledge producers;

2. A source of venturesome technicians and interpreters;
3. Facilities for field testing knowledge offered;
4. Well-defined and respected communication channels;
5. An information storage and retrieval service;
6. A cadre of diffusion agents functioning at grass roots level to insure that worthy knowledge is adopted;
7. Economic incentives for the adaptation of innovations offered.

Perhaps the fields of agriculture, medicine, and certain governmental agencies reflect these characteristics (p. 31).

Wolf's seven criteria provide a clear and comprehensive framework for understanding the communication process in the field of education. Taken together, Wolf's criteria provide a means of uncovering factors associated with communication within a given field; and most conveniently, for the purposes of this study, labeled components of change.

The primitive and undeveloped state of many of these overarching components of change accounts for the inability of America's educational systems to respond to accelerating social changes. Education fails to effectively link knowledge producers (i.e., researchers) and knowledge users (i.e., practitioners). Efforts to improve America's educational systems are characterized by change strategies derived from other disciplines and intended for different purposes. The results of such schemes have had little effect on the operations of schools. In a recent assessment, Berman and McLaughlin (1974) remark:

> The principles of knowledge utilization and production so developed rely heavily on the traditions and assumptions of the diffusion literature - a conceptual framework that has only very general and limited application to innovation in education (p. 9).

Hence, more needs to be known about specific strategies and tactics for increasing the flow of information about new ideas, practices, or products between knowledge producers and knowledge users in education.

Greenwood et al (1975) estimate that approximately 10% of the federal aid to public schools, currently exceeding $3.5 billion annually, is aimed at promoting educational innovations. Since the 1960's, more and more effort has been expended in order to improve schools through the dissemination of new products, practices, or ideas. Although much change has occurred, there is still a tremendous gap between the "best" and "worst" schools. As a result, a comprehensive review of the literature of educational knowledge diffusion and utilization is needed in order to 1) review the extent of available research on educational change methodologies; 2) to analyze and "map" available diffusion and utilization knowledge to determine the level of support or lack of support for research generalizations utilized in the construction of educational change methodologies; and 3) to identify needed research.

Careful review of the literature on educational knowledge diffusion and utilization reveals a "messy" situation (Hood, 1972), particularly in previous attempts to construct theoretical models (1) which meaningfully account for factors of importance in the diffusion and utilization of educational knowledge; and (2) which withstand the scrutiny of rigorous experimentation. Present efforts are handicapped by a research tradition described by Miles (1964) as "a mile wide and an inch deep." Early efforts to study the problem of linking knowledge producers and knowledge

users were beset with cowbird approaches.* Research generalizations from agriculture, medicine, rural sociology, and marketing were thought to be useful frameworks for studying educational knowledge diffusion and utilization.

The absence of a well-developed research tradition on the spread of educational innovations resulted from the liberal borrowing of strategies and methods from other traditions of research. According to Rogers and Shoemaker (1971) "...most of the innovations that have been studied resulted from physical or biological science research rather than from social science research (p. 79)." That there were stark differences in the spread of weed sprays, fertilizers, antibiotics, or toothpastes and the spread of driver training, modern math, or language labs seemed to elude many educational researchers.

A persistent bias uncovered in educational diffusion research is that past studies have failed to consider 1) that educational diffusion occurs within complex bureaucratic structures; 2) that most innovation-decisions are authority or collective decisions rather than individual or optional decisions (Rogers and Shoemaker, 1971) and; 3) that there are many other significant differences in the communication of information about innovations in educational settings which are not found in agriculture, medicine, or industry. Research needs to be conducted in order to develop situation-specific strategies for the dissemination of information to link knowledge producers and knowledge users in education.

---

*The cowbird is unique in that it sidesteps nestbuilding and nurturing of the young by laying its eggs in other birds' nests.

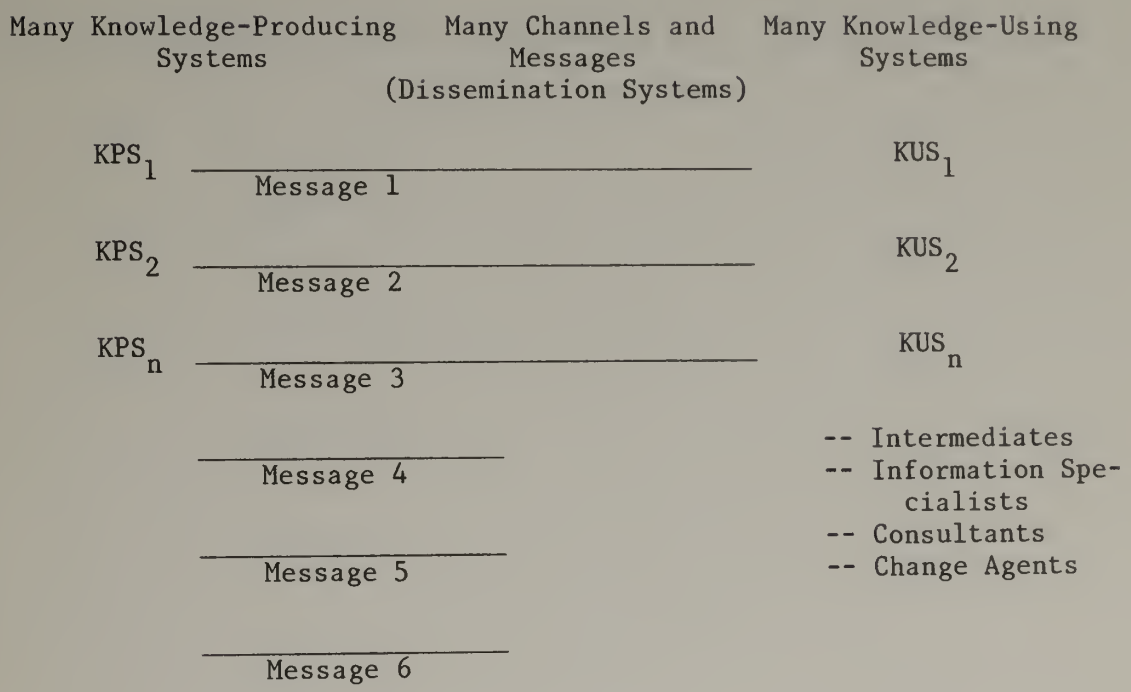
In a recent study, Allan (1977a) discovered that much of what is currently reported in the literature has not been systematically tested in educational settings:

> Even though the diffusion/utilization literature within the field of education is extensive, few educational researchers actually concern themselves with the systematic study of widely accepted diffusion/utilization generalizations within educational settings. Literature sources reveal a handful of individuals who have pursued such inquiry. Richard Carlson, Ronald Havelock, Henry Bricknell, and W. C. Wolf, Jr. characterize persons within the set (p. 13).

As a result, a priori assumptions regarding the generalizability and validity of research findings from other disciplines are routinely applied and seldom questioned in the construction of communication methodologies for education. Paisley (1972) offers the following diagram in order to portray the emerging role of dissemination systems and educational change agent roles for linking knowledge producers and knowledge users:

FIGURE A

The Flow of Knowledge in Education (or any other field of study)



Characteristics of dissemination systems are difficult to study since so little is known about the variables and processes involved. Havelock (1972) has suggested that dissemination systems need to remedy difficulties and deficiencies in both of the other systems (KPS-KUS). Only recently has information pertinent to educational dissemination been reported in the literature in sufficient scope and detail to make the construction of viable dissemination models possible. Controversy exists, however, as to the utility of certain dissemination strategies and tactics since they rely heavily on multi-disciplinary research traditions. The uniqueness of successful educational dissemination efforts of the past (for example, the spread of modern math) have failed to provide any generalizable or scientific data by which educational dissemination can be understood more completely and replicated in other settings or with other innovations.

As a result of increased federal funding and research, there is an emerging body of information available to researchers interested in constructing dissemination methodologies designed to link knowledge producers (i.e., researchers) and knowledge users (i.e., practitioners). The degree to which current efforts 1) reflect identified factors of importance in the dissemination of educational products, practices, or ideas and 2) which withstand the scrutiny of rigorous experimentation will determine how successfully America's educational systems will respond to social changes in the future.

The Problem

For years, educational researchers have attempted to construct theo-

retical models which meaningfully account for factors of importance in the dissemination of educational products, practices, or ideas. In addition, such models need to withstand the scrutiny of rigorous experimentation. A fair amount of agreement exists among these researchers with regard to point one; none of them have been able to broach point two to date.

Dissemination tools are needed which will demystify the process of educational change and insure that successful change enterprise can be more effectively generalized and unsuccessful change enterprise more carefully avoided. Although the educational diffusion/utilization literature abounds with accounts of successful change activities, much of what is reported is not generalizable to other settings or to other innovations. Hence, educational change continues at a characteristically slow and uneven pace. Innovations are adopted or rejected without the benefit of any valid data as to their consequences or intrinsic worth. Successful change enterprise remains more of an art form and less of a science; and unsuccessful change enterprise continues to occur - widening the gap between the "best" and "worst" schools. Paisley (1972) states:

> Left to itself, education's 'natural' diffusion and utilization network brings about rapid change in advantaged districts. The 'natural' diffusion and utilization network widens the gap between the haves and have-nots (p. 18).

Developing and testing a body of generalizations about the dissemination process in education has proven to be a difficult endeavor. Variables and processes are identified through research as pertinent to dissemination tasks. The outlines of a "recipe" emerge. As in cake-baking, certain ingredients (variables) and certain directions (processes) are specified. Once the recipe has proven effective (that is, delicious cakes

are produced or information is disseminated successfully), the recipe may be employed by many other people with a reasonable degree of success.

Someone had to specify the ingredients (variables) and directions (processes) needed to produce delicious cakes or successful dissemination. Unfortunately, most educational dissemination "recipes" are constructed with ingredients and directions from other disciples (rural, medical, and general sociology; economics and marketing). Questions raised in recent years about the generalizability of such research know-how across disciplines represent a threat to the effectiveness and viability of such tools to link knowledge producers and knowledge users in educational settings.

Research has revealed that 1) conditions for change, 2) characteristics of the innovator, 3) characteristics of the innovation, 4) characteristics of the target audience, and 5) characteristics of linkage systems are important and overarching factors in educational knowledge diffusion and utilization (Wolf, 1974). The first four are the ingredients (variables) and the last is the directions (processes) for a dissemination "recipe".

The following factors seem to be related to technology transfer states Wolf (1974):

FIGURE B

Factors Empirically Related to Technology Transfer

Antecedent Variables	Manipulable Variables	Outcome Variables
1. Conditions for Change	1. Characteristics of Linkage or Diffusion Strategies and Tactics	1. Characteristics of Adoption or Utilization Decisions
2. Characteristics of Innovator or Linking Agent		2. Characteristics of Decisions to Reject
3. Characteristics of Innovation		3. Characteristics of Decisions to Defer Action
4. Characteristics of Target Audience or Adopting Units		

Wolf's theoretical construct set forth in Figure B was utilized by William Welsh (1976) to construct a dissemination methodology which was designed to meet the needs of educational practitioners through the dissemination of products. The methodology consists of ten primary steps (and numerous sub-steps):

1. Planning
2. Product modification
3. Identifying appropriate diffusion strategies and tactics
4. Conducting needs assessments
5. Focusing upon specific target audiences
6. Identifying early adopters and opinion leaders within target audiences

7. Setting forth procedures for contacting early adopters and opinion leaders
8. Utilizing early adopters and opinion leaders to sustain diffusion plans
9. Systematically evaluating effects of a product upon targeted settings
10. Systematically evaluating diffusion strategies and tactics in relation to product impact upon targeted audiences.

Steps four and nine relate to conditions for change; step two takes into account characteristics of the innovation; steps four through seven pertain to characteristics of the target audience; and steps three, seven and eight relate to characteristics of linkage systems. Characteristics of the innovator are not included in this methodology. However, since Welsh's initial effort in 1976, further developmental work by Wolf (1979) has resulted in the addition of a step designed to address the important characteristics of the linkage agent. In addition, the methodology was refined through the consolidation of certain steps and shortened by the use of more precise language. Hence, Welsh's work (1976) provided the base for a subsequent and evolving linkage tool, the Wolf-Welsh Linkage Methodology (1979).

Wolf (1979) and Welsh (1976) made use of a tool called "metamethdology," designed by Thomas Hutchinson of the University of Massachusetts, to insure that the methodology was systematized, standardized, and operationalized. Research tools which reflect these three attributes readily lend themselves to reliability concerns. A logical sequence of steps, a specificity of actions for the user(s), and the ease with which different

users can follow the same procedures give promise that more reliable and generalizable data can be derived from the use of such a methodology.

Despite its promise, the dissemination methodology developed by Welsh (1976) and Wolf (1979) is rooted in research know-how gleaned from more than a half dozen disciplines. And Wolf's theoretical model (1974), upon which Welsh based the Methodology, is derived from similar research know-how. Research conducted in recent years suggests that such know-how may not apply to educational dissemination activities. Hence, the ingredients (variables) and directions (processes) utilized by Welsh (1976) and Wolf (1979) in his dissemination "recipe" may not be appropriate for use within the discipline of education.

One way to address such a problem is to review research and development work expedited within educational contexts. If educationally based research yields data similar to data derived from other disciplines, the problem of generalizability disappears. Conversely, the acquisition of starkly different data would confirm the generalizability problem as a serious threat to the utility and viability of the Wolf-Welsh Linkage Methodology (1979) in educational settings. More knowledge about this problem is needed in order to construct a viable methodology for the field of education.

In addition, research and development work conducted in educational contexts will be used to test the completeness of Wolf and Welsh's research. More knowledge about the completeness of the Wolf-Welsh Linkage Methodology (179) is needed.

Finally, whereas the quantity of educational knowledge diffusion/utilization work is well-known, the overall quality of these studies has

been questioned frequently. Since the quality of education's research tradition directly influences what can be learned about both the generalizability problem and completeness question, more needs to be known about the caliber of this research.

In summary, more needs to be known about the generalizability of diffusion/utilization research know-how, more educationally-based data pertaining to diffusion/utilization strategies are needed, and more needs to be known about the scope of dissemination tools like the Wolf-Welsh Linkage Methodology (1979).

Specific Objectives

Since enough evidence exists to question the multi-disciplinary research utilized to construct the Wolf-Welsh Linkage Methodology (1979) - an evolving and promising dissemination tool for linking knowledge producers and knowledge users in education - this study proposes to examine research and development work expedited in educational contexts in order to:

1. Report on the extent of available educational research know-how which relates to the linkage variables and processes utilized to construct a dissemination methodology (Wolf-Welsh, 1979);
2. Analyze and map available diffusion/utilization knowledge to determine the level of support or lack of support for research generalizations utilized in the construction of the Wolf-Welsh Linkage Methodology (1979);
3. Indicate what research and development work must still be expedited in order to insure the appropriateness and viability of the

Wolf-Welsh Linkage Methodology (1979) as a dissemination tool for the field of education.

Significance

Previous attempts to construct dissemination methodologies for educational users have been hampered by a variety of methodological and operational obstacles. Problems of reliability and generalizability plague efforts reported in the literature. Anecodote, more than analysis, characterizes much of educational diffusion/utilization research. Hence, most models of educational change are constructed utilizing variables and processes reported in other traditions of research.

The Wolf-Welsh Methodology offers the hope that the field of education will finally possess a research tool capable of widespread utilization and which is systematized, standardized, and operationalized. Information acquired through continued applications of such a methodology will provide more useful data related to linking knowledge producers and knowledge users in educational settings. Allan (1977b) has pointed out that such a methodology would:

> 1) Provide a means by which product developers could effectively disseminate their product to appropriate potential consumers.
> 2) Lead to an increase in the number and skill of diffusion agents functioning at the grass roots level.
> 3) Help compensate for the lack of a well-defined and respected communication channel to effectively diffuse innovations to appropriate target audiences.
> 4) Aid in making educational change more systematic.
> 5) Make dissemination more of a science and less of an art (p. 22).

The significance of the proposed study is rooted in the initial purposes for construction of the methodology. However, additional work needs to be done in order to assure that the "building blocks" used to construct the Wolf-Welsh Linkage Methodology (1979) are rooted in know-how which is applicable to educational dissemination activities. The failure of many educational dissemination models of the past can be traced to the absence of any rigorous examination of available research, as well as the continued utilization of research generalizations derived from agriculture, medicine, or industry.

The proposed study, although specifically focused on the Wolf-Welsh Linkage Methodology (1979), has additional significance to the degree that such a review of educational dissemination know-how can be utilized to understand the process of educational change. Havelock and Paisley (1972) remark:

> The domain of change needs some mapping; the first kind of mapping is a classification schema of: areas touched on, variables explicit or implicit, dissemination and installation assumptions, and the innovation as mediate, means or self-contained end. Other schematics are possible according to purpose. From such descriptive mappings some orderly arrangement can be created and new questions raised (p. 6).

Hence, significance is related to the need for educationally-based research to be applied to a dissemination methodology which can improve the linkage between knowledge producers and knowledge users. Information gained from the proposed study can be:

1) utilized to revise existing dissemination strategies and tactics;

2) incorporated into training activities designed to train linking agents for education;

3) utilized to construct additional dissemination methodologies designed for a variety of specific educational user(s).

Limitations

The study proposed is rooted in a theoretical construct set forth by Wolf (see Figure B) and in a modus operandi called "metamethodology" designed by Hutchinson. Neither Wolf's construct nor Hutchinson's modus operandi have been experimentally validated. Some evidence exists to support both, but not enough exists to convince the skeptical. Hence, the foundation upon which the proposed study rests is a "fuzzy concept."

It is not unreasonable to believe diffusion/utilization generalizations, derived from a variety of disciplines, may not apply to educational practice in a predictable manner. Some empirical work and strong inference support such a belief. However, not enough experimental evidence has yet appeared to seriously challenge the ubiquity of many diffusion/utilization generalizations. If a diffusion/utilization know-how could be shown to generalize in a predictable manner across educational practice, the proposed reconsideration of Wolf and Welsh's methodology would not be necessary.

Procedures

In Chapter III of the dissertation, a general analytical tool for reviewing educational dissemination research will be presented. From this framework, the Wolf-Welsh Linkage Methodology (1979) will be reviewed in light of 1) research utilization; 2) reliability and generalizability in educational settings; and 3) needed research. If educationally-based re-

search yields data similar to data derived from other disciplines, then the problem of research utilization and generalizability disappears. Conversely, the acquisition of starkly different data would confirm the generalizability problem as a serious threat to the development of dissemination strategies for educational user(s).

Some research areas appear controversial; others do not. There is a need for a review of the educational research literature pertaining to dissemination variables and processes. The distillation of such a research review compared to research know-how derived from other disciplines should reveal a series of logical "gaps," points of agreement, as well as areas of controversy which pertain to the dissemination of educational products, practices, or ideas. The ordering of available knowledge and the isolation of a series of generalizations which have been systematically tested in a variety of settings and with a variety of innovations would be a giant step towards improving the quality and science of educational dissemination.

Definition of Terms

1. DISSEMINATION: The presentation of a product to a target population in such a way that such presentation maximizes the probability that the product will be adopted and used on a continuing basis.

2. METHODOLOGY: A systematic, standardized, operationalized set of rules and procedures designed to accomplish a given purpose.

3. SYSTEMATIZED: Implies the presence of a logical sequence to the steps; each is included in its place for a particular reason.

4. OPERATIONALIZED: Implies that the rules and procedures are stated with sufficient specificity which would direct the individual user(s) to follow the methodology. They are stated in indirect behavioral terms.

5. STANDARDIZED: Implies that each individual using the methodology will use the same set of rules and procedures--serves for purposes of replication.

6. COMMUNICATION METHODOLOGY: Deals with the diffusion (spread) and utilization (effects) of innovations. Synonymous with dissemination methodology.

7. DIFFUSION: Spread

8. UTILIZATION: Effects

9. NEED: The discrepancy between the ideal and the real for a person or group. The lack of a product,

process, or idea that makes the ideal somehow less than the real.

10. PRODUCT: Any piece of "hardware," process or idea capable of meeting a need for a designated target population.

CHAPTER II

Orientation

Chapter II is organized around two themes which relate to the major objectives identified in Chapter I. First, specific educational research studies are reviewed in order to determine major perspectives of the educational diffusion literature and the generalizability of research derived from other disciplines. And second, specific educational research studies are reviewed in order to identify important influences, policies and procedures which affect educational diffusion/utilization tasks. Specific educational research outcomes, related to the five overarching variables identified by Wolf (1974), are reviewed and categorized in Chapter IV.

Perspectives of The Educational Diffusion Research Literature and The Generalizability of Research Derived From Other Disciplines

For years, social scientists have struggled to construct methods of research capable of providing information on variables and processes related to the adoption of innovations in particular, and social change in general. Information reported from these studies can be roughly categorized as diffusion research. Eicholz and Rogers (1964) defined diffusion as:

> ...the process by which an innovation spreads. The diffusion process is the spread of a new idea from its source of invention or creation to its ultimate users or adopters. Thus diffusion entails the communication or dissemination of an idea, and culminates in its adoption by individuals (p. 299).

A research tradition is a "series of research studies on a similar topic in which successive studies are influenced by preceding investigations" according to Eicholz and Rogers (1964). Six major diffusion research traditions - anthropology, early sociology, rural sociology, education, industrial and medical sociology were identified by Rogers and Shoemaker (1971). In their comprehensive volume, The Communication of Innovations (1971), the authors summarized and produced a series of multidisciplinary generalizations from over four thousand diffusion studies reported in the six research traditions.

Rural sociologists have been especially sophisticated as well as prolific in their research investigations. The adoption of hybrid seed corn (see Ryan and Gross, 1943 for example), farm machinery, weed sprays and numerous other agricultural innovations and technologies have all received attention from these researchers. Methods of research utilized to study agricultural innovations have been widely used and applied in other research traditions. Rogers and Shoemaker (1971) remarked:

> Rural sociologists have been especially active diffusers of the diffusion approach to other fields, such as education, public health and marketing. One result is that the specific research methods satisfactory for the study of farmers' adoption of hybrid seed corn have occasionally been utilized without complete adaptation in other research contexts. Much of the total body of diffusion research, especially such matters as the innovation-decision studied, the reliance upon recall data from personal interviews, and the individual variables correlated with innovativeness, bears the indelible stamp of its intellectual ancestry in rural sociology. And this academic inheritance is frequently inappropriate for the varied settings in which diffusion research is conducted today (pp. 56-57).

Earlier, Combs and Snygg (1970 - originally reported in 1949), related the importance of theoretical perspectives and their application to research:

> Theory which holds for one frame of reference or one problem may be totally inadequate, even misleading, in another. Theory can be constructed on many levels and for many different purposes, but its maximum efficiency is reached only on the levels and purposes for which it is designed (p. 5).

Hence, these studies suggest that theoretical as well as methodological constraints exist among and between the six major diffusion research traditions.

A number of educational sources questioned the validity and generalizability of multidisciplinary diffusion research and its application to educational linkage enterprise. Questions raised by these researchers formed the foundation of this study. For example, Allan (1977b) stated that addressing the validity of applying principles of innovation diffusion developed in sociology and anthropology to education was crucial. However, few researchers have attended to this problem. Differences need to be examined and if significant, new principles constructed which are unique to educational linkage tasks according to Allan (1977b, p. 1).

Heathers (1974) suggested that models of educational change should be built involving a series of cause-effect variables. Research from other disciplines should be used only when it is clearly applicable. More rigorous designs, clearly defined change objectives, and specific tests of alternative strategies and tactics employed need to be used in order to identify these cause-effect variables according to Heathers (1967, p. 51).

Hood (1973) found a "dearth of applied experimental research," little validated knowledge and a generally contradictory conceptual base upon

which to develop an effective practice improvement project for education (pp. 48-59).

Berman et al (1975) turned to the evaluation and case study literature and discovered a number of problems in structuring a comprehensive theory of planned educational change:

> It is not possible to further structure the problem of the effectiveness of innovation on the basis of the empirical evidence gathered so far...evaluations of innovative practices are beset with conceptual and methodological problems. Much of the evidence is contradictory; evaluations have been found to be incomplete or in error; important variables misspecified; dependent and independent variables ambiguous; the relationship of treatment to educational goals is uncertain; and measurement or method is not comparable across studies. However, these empirical difficulties confound the fundamental problem: the absence of a systematic theory of planned change (p. 2).

Piele (1975) called for more rigorous comparative studies to determine important linkage variables. In addition, Piele (1975) found little empirical research material and a quantity of studies which were "tentative" or "dubious in their applicability" (p. 65). Later investigations, for example Hood and Cates (1978) and Cates (1978), reported similar outcomes in their review of the linkage agent literature. Hence, previous efforts to construct a systematic and empirically-based set of diffusion principles which explain educational linkage enterprise have proven difficult. The lack of integration and the generally poor quality of educational diffusion research is attributed to a number of factors:

- a weak knowledge base on current practice; (for example, see Carlson, 1965; Heathers, 1975; Giacquinta, 1973; Wolf, 1980; Berman et al, 1975)
- utilization of research and research modus operandi from other disciplines (for example, see Brickell, 1964; Guba, 1965; Chin, 1967; Carlson, 1964; Wolf,

1975; Allan, 1977a; Gross et al, 1971 and Emrick et al, 1977); and,

- the poor instrumentation and poor quality of empirical research conducted (for example, see Berman et al, 1975; Wolf, 1980; Hood and Cates, 1978; Cates, 1978; Piele, 1975; Crandall, 1977; Giacquinta, 1973; and Hood, 1973).

Taken together, these major aspects of the educational diffusion research literature account for the tentativeness with which any set of factors can be generalized to educational linkage enterprise.

Some researchers have provided specific frameworks related to evaluating educational know-how. For example, Bennis (1958) reported on four distinct biases which alternatively affect major models of educational change:

> RATIONALISTIC BIAS (No Implementation of Program)
> Most of the strategies rely almost totally on rationality. But knowledge about something does not lead automatically to intelligent action.
> TECHNOCRATIC BIAS (No Spirit of Cooperation)
> ...change typically involves risk and fear. Yet change efforts sometimes are conducted as if there were no need to discuss and 'work through' these fears and worries.
> INDIVIDUALIST BIAS (No Organization Strategy is Involved)
> This refers to strategies which rely on the individual while denying the organizational forces and roles surrounding him.
> INSIGHT BIAS (No Manipulability)
> ...insight leads to change, though this can be challenged, but with the lack of provision of variables accessible to control (p. 68).

Guba (1965) reviewed the multidisciplinary research literature and found that it had limited applicability or generalizability to educational dissemination tasks. Seven distinct differences between education and these other research traditions were earmarked by Guba:

> 1. For most reported research the change or innovation in question is accepted or rejected by an individual entrepreneur (e.g., the farmer or physician); in education we are concerned about acceptance by an agent of a bureaucratic social system.
> 2. Decisions for change that have been studied are typically individual or family decisions; in education we are concerned with a collective social decision.
> 3. Sources of information about innovations in many studies areas are well-institutionalized (e.g., agricultural extension); this is not true in education.
> 4. Most innovations in other areas are disseminated through institutionalized change agents (e.g., the county agricultural or home extension agent); few effective institutionalized change agents exist in education (possibly the textbook salesman).
> 5. The incentive for the adoption of most studied innovations is economic (e.g., more bushels per acre); the economic motive, while not eliminated in education, is displaced to a considerable degree by a social motive.
> 6. Most innovations in other fields are based on research evidence and are thoroughly field tested before being made generally available (e.g., through the agricultural experiment station); this is not true in education.
> 7. The acceptance of educational innovations is affected by forces and factors not found in those areas of innovation that have been widely studied (pp. 19-21).

Lippitt (1967) identified similar problems and processes in education which are not found in applied biological or physical science research. Attention to these problems is required before progress can be made in educational change theory. Differences noted by Lippitt (1967) include:

> 1. Significant changes in the values, attitudes and skills of the social practitioner. A deeper personal involvement is required in adopting the new practice than in agricultural, industrial, or medical practice.
> 2. The nature of the innovation. Most significant changes in educational practice or mental health are really adaptations rather than the adoption of the innovations of others. What is being passed on is not a thing (e.g., a new seed, new implement, new drug, or new machine) but is a new pattern of behavior to be used in a new social context.

> 3. The lack of feedback mechanisms regarding the effectiveness of his adoption effort. A teacher lacks the criteria and the tools to validate innovative practice as compared with farmers, doctors, or industrial workers.
> 4. The lack of communication channels. There are neither competitive challenge or good communication channels to stimulate sharing and improvement of practice.
> 5. The lack of developed networks, procedures, and manpower resources. There is a lack of inservice training and support needed to stimulate and maintain resource utilization as knowledge grows (pp. 76-78).

Hansen (1968) found educational change extremely variable and complex and impossible to reduce to a series of discrete steps. More data is needed before successful change can be planned and unsuccessful change avoided. Disagreements between people involved complicate the problem further according to Hansen (1968):

> Scholars and practitioners alike disagree on the definition of change, on the theories and strategies of change, and on the most effective ways for the 'change agent' to work with his client system (p. 63).

In another case, Wolf (1973) analyzed communication within the field of education as a matter of "fortuitous circumstance" (p. 7). Eight traditional channels of educational communication were identified by Wolf - workshops and institutes, periodic meetings, printed materials, radio/television/motion pictures, demonstrations, consultants, formal training and designated job slots. The integration, efficiency, and cost effectiveness of these components caused Wolf (1973) to remark:

> Taken together these eight components offer an impressive array of opportunities for diffusing and utilizing knowledge within the field of education. It is unfortunate that many of these opportunities are out of the context of users' methods; that much proliferation of effort - at considerable expense - occurs routinely

> among the components; and, that many potential users, aren't affected by the communication (p. 7).

A recent report by a federal task force - the Dissemination Analysis Group (DAG) - recommended action on the following problems:

> 1. Present strategies and methods for dissemination are not likely to achieve high impact.
> 2. Few mechanisms exist for sharing among peers, and between different groups of educational specialists.
> 3. Evaluation information for judging among relevant alternatives is insufficient (p. 35).

Emrick and Peterson (1978) summarized and reported on findings from five dissemination studies which were selected on the basis of scope, relevance, methodology and availability. A number of interrelated factors critical to successful linkage were identified in this study. In addition, Emrick and Peterson (1978) focused on three major research implications for investigation:

> 1. The most critical need is for improved knowledge of the interpersonal referral networks, subcultures, and decision-making structures characterizing all aspects of American school systems.
> 2. More detailed knowledge is needed about the prerequisites, appropriate training procedures, and materials requirements for developing effective intermediaries.
> 3. More definite evidence is needed about the adoption/utilization process and the range and extent of its consequence on school functioning and effectiveness (p. 16).

These studies provide perspectives related to three distinct aspects of educational diffusion literature - (1) the generalizability of research derived from other disciplines and its application to educational contexts; (2) the validity or lack of validity of completed educational research related to innovation adoption, communication, and linkage roles and functions; and (3) needed research and problems associated with the degree of

integration and overall quality of educational diffusion research.

The objectives of the study set forth in Chapter I are derived from the need to know answers to questions such as:

1. Are there linkage generalizations, based upon research completed in disciplines other than education, which can be legitimately utilized within varied educational contexts?
2. Are there linkage generalizations, based upon research completed in disciplines other than education, which should not be utilized within varied educational contexts?
3. Are there linkage generalizations, based upon research completed in disciplines other than education, which should be - but are not being -utilized within varied educational contexts?

Research sources presented in this first section of Chapter II underline and describe problems associated with current linkage know-how. Questions related to the validity, generalizability, focus and completeness of educational research were presented. Objectives of the study and underlying assumptions and questions about linkage enterprise were stated and related to selected research studies reported in the literature.

Influences, Policies and Procedures Which Affect Educational Dissemination Tasks

In the first section of the chapter, a review of the literature uncovered a number of studies related to the validity and generalizability of completed educational diffusion research. In this section, information reported on major influences, policies and procedures which affect educa-

tional dissemination tasks will be reviewed. In this way, overarching conditions and constraints can be identified and put into a perspective which offer insight into the complexities of developing educational linkage roles and resources.

The tradition of educational diffusion research has been described by a number of adjectives - from "chaotic" and "messy" to "shallow" and "weak." Disorganization and large amounts of speculation and inference characterize much of what is known about educational diffusion/utilization topics. Remedies for these problems are numerous. Some researchers have suggested more rigorous experimental designs for evaluating linkage efforts, while others insist that comparative studies be conducted in order to determine the relative effectiveness of diverse linkage strategies and tactics. Both of these suggestions hold merit and such research is obviously needed in order to verify the variety of linkage agent roles, strategies and tactics which have been suggested in the literature (see Piele, 1975; Cates, 1978; and Wolf, 1980 for example).

In 1976, the Interstate Project on Dissemination (IPOD) published a comprehensive report on communication problems and processes among federal, state and local educational organizations involved with dissemination tasks. Although dissemination is generally pictured as a "sending" process, IPOD (1976) described a number of strategic policies, influences and procedures which affected dissemination and linkages <u>within</u> and <u>between</u> federal and state agencies. Since dissemination activities appear to emanate from "top-to-bottom" initiatives, the fragmentation of effort, organization and policy reported by IPOD seem crucial. For example, the report pictures dissemination as a two-way process with important dissem-

ination/utilization linkages occuring at the state level (SEA). Federal dissemination policy and funding for building state capacity as the primary linkage agency to individual schools and local districts (LEAs) seem disorganized and weak according to IPOD. Major problems, in addition to inadequate funding included:

> 1. Most state education agencies have not identified formal policies or procedures regarding publication or production of materials used for dissemination.
> 2. The concept of a coordinated dissemination system often lacks priority with administrative levels.
> 3. The dissemination concept is vague enough to seem to include a wide range of activities. The lack of a distinct definition makes centralization of resources and activities difficult (p. 9).

Additional information reported by IPOD (1976) is summarized below:

- perceptions of dissemination responsibilities vary between levels;
- definitions of dissemination roles, functions and responsibilities are ambiguous and poorly defined between levels;
- inadequate federal funding and imprecise project language relative to funds handicap efforts to build state dissemination capacity;
- vague designations of intended target audiences or recipients of dissemination efforts;
- inconsistent Congressional legislation related to the National Institute of Education (NIE) which in turn, affects dissemination capacity of state and even the local level (pp. 2-35).

As a result of these factors, IPOD (1976) summarized:

> The analysis of legislation and regulations reported herein would indicate that there is no system for educational research and development and that there is no system for disseminating educational products and practices. There is no mechanism through which more than 50 responsible agents can operate according to a coherent plan for smooth functioning. Yet, there are in existence at least 208 legislative and regulatory dissemination mandates to which those agents are expected to be collectively responsive, mandates for an activity which is neither defined nor clearly described (p. 25).

The relationship between federal legislation, delegation and coordination, and state level dissemination initiatives and capacities is vital. Organization and development of dissemination systems is a "trickle-down" phenomena - from federal, to state, and finally to local levels. Increasing evidence as to the importance of LEA needs, local conditions and initiatives and leadership in support of change reveal the importance of influences and conditions reviewed by IPOD (1976).

In another case, Paul (1977) summarized seven specific influences on linkage agent roles and functions:

> (1) incompatible language, values and reward systems that separate researchers, linkers, and users;
> (2) weak institutional support, security, and recognition for linking agents;
> (3) substantial imbalance between number of users and number of linkers;
> (4) demand on linkage agents to possess both research, subject matter, and change process competencies;
> (5) organizational structures and administrative arrangements which limit involvement of linkage agents and which limit time for user linkage agent interaction;
> (6) no formal training and/or legitimizing of linkage agents;
> and,
> (7) geographical limitations on the extent of researcher linkage agent user interaction (p. 37).

Wolf (1980) reported on a variety of problems related to the nature of knowledge selected for diffusion, overcommitment, marginality of role, stability of performance and institutional stability of linkage agents (pp. 9-15).

Implications from these studies suggest that there are a variety of factors and influences which account for successful linkage enterprise. Important agencies, funds, and inter-connected resources may explain, in

part, how effectively information is communicated. Additional difficulties can be expected from influences on the linkage agent role and function reported by Paul (1977) and Wolf (1980).

Hood (1973) described three different sets of communication problems which beset educational R & D:

> (1) within the R & D information network;
> (2) between the R & D information network and the practice improvement information network and;
> (3) within the practice improvement network (p. 97).

Hence, Hood (1973) believes that attention to the organization and interface of the various dissemination systems is required. Other researchers, for example, Sieber (1974), Rich and Zaltman (1978), Havelock (1973), Paisley (1972), Wolf (1979) and Pincus (1974) have suggested the need to examine various aspects of educational dissemination capacity. As a result, there are problems associated with the development, organization, coordination and evaluation of dissemination systems in general.

Pincus (1974) related a number of possible causes which work together in a "vicious circle." For instance, practitioners do not value or utilize the scientific method or research; consequently, little research is incorporated into routine practice. Due to such under-utilization, research outcomes are generally poor in quality. Hence, practitioners see even less value of research reported (p. 132 and adapted from Carlson, 1965).

The present situation with regard to educational R & D is a combination of various disadvantages according to Pincus (1974):

> (1) Researchers are interested in disciplinary prestige more than in problem-solving in the schools.
> (2) Even when, in the case of regional labs, there is considerable incentive to produce R & D results that

> can be applied in the schools, the gulf between innovation and implementation remains all too often unbridged.
> (3) Researchers disseminate results through journal articles and reports; practitioners learn through briefings, meetings, and informal discussion.
> (4) Research and development agencies follow an R & D change model that views the schools as passive adopters of new products, but the schools themselves decide to adopt and implement innovations in light of a host of organizational considerations which are not incorporated in the R & D model of change.
> (5) Researchers and practitioners often don't talk the same language because their operating styles, perceptions of issues, and professional priorities are so different (p. 132).

Taken together, these five factors identified by Pincus (1974) illustrate aspects within the educational R & D community which affect how effectively innovations or results of R & D activity are disseminated to potential users.

Recommendations reported by IPOD (1976), DAG (1976), Paul (1977), Hood (1973), Wolf (1980) and Pincus (1974) substantiate the effect of diverse influences, policies and procedures on the quality, efficiency and scope of educational dissemination and linkage systems. Substantial opinion and some empirical evidence exist to support the views of these researchers.

The review of the literature uncovered a number of sources which provided information on the two themes which organize the chapter. These two themes relate (1) to the validity and generalizability of research derived from other disciplines; and (2) to overarching influences and problems associated with educational dissemination and linkage systems. Two conclusions are offered in light of major objectives of the study and research reviewed in the chapter:

1. More research is needed to determine the generalizability and validity of research utilized to construct educational dissemination models and emerging linkage agent roles and functions. Present know-how is questionable on a number of grounds.
2. More research is needed to determine effective methods of disseminating the products, programs and practices of educational R & D to potential users. Present methods appear to have nominal effects.

CHAPTER III

Orientation

The scope and sequence of modus operandi, designed to address the three specific objectives described on page 15, are summarized in Chapter III. These modus operandi were adopted to expedite a critical analysis of educational research and development work, completed in recent years, which pertains to the diffusion and utilization of new educational products, practices and ideas. Distinctive aspects of the analysis include:

1.1 A review of the designated literature in the context of Wolf's (1974) theoretical model and in the context of an evolving linkage methodology (Welsh, 1976; Wolf-Welsh, 1979).

2.1 A comparative analysis of generalizations derived from the education-based information on the one hand and the multi-disciplined-based information on the other.

3.1 The identification of gaps between these two sets of information which require further research.

It is believed these analyses will result in the establishment of a base of knowledge upon which to design and carry out more rigorous, disciplined inquiry.

Much is known about which variables and processes were utilized to construct the Wolf-Welsh Linkage Methodology (1979). And valid questions have been raised regarding their generalizability to educational dissemination tasks; and not, as yet, satisfactorily answered. Hence, each of these "building blocks" needs to be scrutinized carefully.

The chapter is organized according to the three specific objectives of the study. Each objective is restated and then followed by a description of procedures selected to address the objective. Finally, salient elements of the modus operandi are summarized in the format which will be used to report information obtained.

Procedures.

OBJECTIVE 1.1 Report on the extent of available educational research know-how which relates to the linkage variables and processes utilized to construct a dissemination methodology (Wolf, 1974; Welsh, 1976; Wolf-Welsh, 1979).

Wolf's theoretical model set forth in Figure B (p. 12) represents a distillation and synthesis of multidisciplinary research on the dissemination of innovative products, practices or ideas to meet the needs of identified target audiences. In his model, Wolf (1974) isolated broad classes of independent variables and related them to the dependent variable - adoption. Major components of Wolf's theoretical model involve:

1. conditions for change;
2. characteristics of the innovator or linking agent;
3. characteristics of the innovation;
4. characteristics of the target audience or adopting units;
5. characteristics of the linkage or diffusion strategies and tactics.

It is believed attention to and operationalization of the first four sets of antecedent variables will result in a set of factors pertinent to developing the fifth component in Wolf's scheme - an effective dissemination plan.

Both the theoretical construct set forth by Wolf (1974) and the linkage methodology developed by Wolf and Welsh (1979) are rooted in research derived from other disciplines. Know-how derived from such research traditions has been shown to be suspect when applied to educational dissemination tasks. As a result, the viability and utility of the linkage methodology developed by Wolf and Welsh rest on theoretical and empirical areas which are questionable.

Rogers and Shoemaker set forth modus operandi for mapping the extensive diffusion research literature in their book, The Communication of Innovations (1971). Their first step was to organize the relevant interdisciplinary research around common themes. Succinct generalizations were then set forth to reflect the flavor of the research pooled within each theme. The gross number of studies identified in relation to each generalization were then divided into:

- those studies which supported the generalization;
- those studies which did not support the generalization;
- those studies which didn't reveal any pattern.

These sub-divisions were reported along with each generalization in the Appendix of the book.

The scheme employed by Rogers and Shoemaker puts into perspective aspects of the diffusion/utilization phenomenon which have been well-researched, aspects which call for more sophisticated research treatment, and aspects which have been neglected. This researcher aspired to replicate Rogers and Shoemaker's work within the framework of recently-completed educational research on diffusion/utilization topics. More precisely, the researcher aspired to identify, organize and analyze recently-

completed educational research which related to specific steps of the latest version of the Wolf-Welsh Linkage Methhodology (1979).

The following generalizations, rooted in the inter-disciplinary diffusion research tradition, represent building blocks used by Wolf (1974) to construct his theoretical configuration of linkage enterprise.

Research-based generalizations which support the Wolf-Welsh Linkage Methodology (1979).

1.0 The Linkage Agent (Part I of the Methodology)

1.1 Successful linkage enterprise is positively related to certain behavioral characteristics (i.e., reliability, ability to listen, punctuality, etc.) of the person or persons responsible for the linkage enterprise.

1.2 Successful linkage enterprise is positively related to the effective utilization of certain professional expertise (i.e., needs assessment expertise, communication expertise, evaluation expertise, etc.) by the person or persons responsible for linkage enterprise.

1.3 Successful linkage enterprise is positively related to the degree of compatibility between the professional background and demographic characteristics of the person or persons responsible for linkage enterprise and the professional background and demographic characteristics of the typical member of a targeted audience.

1.4 Successful linkage enterprise is positively related to the amount of time invested by a person or persons in linkage enterprise.

1.5 Successful linkage enterprise is positively related to the extent to which the person or persons responsible for linkage enterprise have

experienced such success in the past.

2.0 Conditions for Change (Part II, IV and V of the Methodology)

2.1 Successful linkage enterprise is positively related to a targeted audience's degree of dissatisfaction with practice earmarked for modification.

2.2 Successful linkage enterprise is positively related to a targeted audience's resource potential (i.e., risk money, facilities, flexible staff, etc.).

2.3 Successful linkage enterprise is positively related to the extent to which members of a targeted audience have experienced such success in the past.

3.0 The Innovation (Part III, IV and V of the Methodology)

3.1 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and identified needs of a targeted audience.

3.2 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and the generally accepted professional practice of persons who comprise a targeted audience.

3.3 Successful linkage enterprise is positively related to the extent to which selected innovations can be physically manipulated (i.e., sub-divided, modified, etc.).

3.4 Successful linkage enterprise is positively related to the extent to which selected innovations can be pilot tested.

3.5 Successful linkage enterprise is inversely related to the complexity of selected innovations.

3.6 Successful linkage enterprise is inversely related to the number of problems members of a targeted audience are able to raise about selected innovations.

3.7 Successful linkage enterprise is positively related to how well available information depicts strengths and limitations of selected innovations.

4.0 The Targeted Audience (Part II and VI of the Methodology)

4.1 Successful linkage enterprise is inversely related to the number of persons within a targeted audience.

4.2 Successful linkage enterprise is inversely related to the number of administrative units (i.e., schools) within a targeted audience.

4.3 Successful linkage enterprise is inversely related to the number of decision-making levels within a targeted audience.

4.4 Successful linkage enterprise is positively related to the extent to which members of a targeted audience participate in the linkage enterprise.

4.5 Successful linkage enterprise is positively related to the extent to which opinion leaders and other influencials within a targeted audience support selected innovations.

5.0 Linkage Modus Operandi (Part VII of the Methodology)

5.1 Successful linkage enterprise is positively related to the amount of time invested in identifying opinion leaders and other influentials within a targeted audience.

5.2 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between

the person or persons responsible for the linkage enterprise and opinion leaders and other influentials within a targeted audience.

5.3 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between opinion leaders and other influentials within a targeted audience on the one hand, and other members of the targeted audience on the other hand.

5.4 Successful linkage enterprise is positively related to the amount of time invested in linkage enterprise by opinion leaders and other influentials within a targeted audience.

6.0 Outcomes (Part VIII and IX of the Methodology)

6.1 Successful linkage enterprise is positively related to systematic evaluation of effects of selected innovations upon targeted audiences.

6.2 Successful linkage enterprise is positively related to systematic evaluation of linkage modus operandi utilized.

While the above list of generalizations isn't the complete, closed set, the list is most representative of what is known about the diffusion/utilization phenomenon. Figure C displays each of the variables and processes expressed in the twenty-six multi-disciplinary research generalizations.

FIGURE C

FACTORS EXPRESSED IN THE MULTIDISCIPLINARY RESEARCH GENERALIZATIONS WHICH SUPPORT THE WOLF-WELSH METHODOLOGY (1979)

1.0 LINKAGE AGENT (Part I of the Methodology)
1.1 personal characteristics;
1.2 professional characteristics (skills and experiences);
1.3 compatibility with target audience (personal and professional);
1.4 time invested;
1.5 past success.

2.0 CONDITIONS FOR CHANGE (Part II, IV and V of the Methodology)
2.1 degree of dissatisfaction (readiness for change);
2.2 resources;
2.3 past success.

3.0 THE INNOVATION (Part III, IV and V of the Methodology)
3.1 needs of target audience } compatibility with;
3.2 professional practice
3.3 divisibility;
3.4 observability (pilot test);
3.5 complexity } inversely related to;
3.6 problems raised by target audience
3.7 information (strengths/weaknesses).

4.0 TARGET AUDIENCE Part II and VI of the Methodology)
4.1 number of persons } inversely related to;
4.2 number of administrative units
4.3 number of decision-making levels;
4.4 participation of members;
4.5 support of opinion leaders.

5.0 LINKAGE SYSTEMS (Part VII of the Methodology)
5.1 time invested to identify opinion leaders;
5.2 interpersonal communication with opinion leaders;
5.3 interpersonal communication between opinion leaders and others;
5.4 time invested by opinion leaders.

6.0 OUTCOMES (Part VIII and IX of the Methodology)
6.1 evaluation of effects (consequences);
6.2 evaluation of *modus operandi*.

Recently-completed educational research resources were drawn from varied sources. The following were scanned between 1977 and the present to identify these studies. Sources included:

1. surveys of research reported in ERIC;
2. papers presented at national conferences;
3. reports of AERA (American Educational Research Association) meetings;
4. research reports in educational journals and books.

Every effort was made to uncover works of importance to this study. Each identified study was examined, categorized by topic and then categorized under the research generalizations. Chapter IV displays the results of this literature search.

OBJECTIVE 2.1 Analyze and map available educational research know-how to determine the level of support or lack of support for research generalizations utilized in the construction of the Wolf-Welsh Linkage Methodology (1979).

Figure D portrays the development and sequence of steps in the Wolf-Welsh Linkage Methodology (1979) - from Wolf's five overarching variables, to the 10-Step Welsh Methodology (1976), and finally, to the revised, 9-Step Wolf-Welsh (1979) dissemination tool. Wolf's revision (1979) of the Welsh Methodology (1976) involved the addition of a step designed to address important characteristics of the linking agent (Step I). In addition, the methodology was refined through the consolidation of certain steps and shortened by the use of more precise language. Complete listings of both methodologies are reported in the Appendix of this study.

FIGURE D

DEVELOPMENT AND SEQUENCE OF STEPS IN THE WOLF-WELSH METHODOLOGY

WOLF'S THEORETICAL CONFIGURATION (1974) 5 VARIABLES

1. Conditions for change
2. Characteristics of the innovator or linking agent
3. Characteristics of the innovation
4. Characteristics of the target audience
5. Characteristics of the linkage system

↓
↓

WELSH METHODOLOGY (1976) - 10 STEPS

1. Planning
2. Product modification
3. Identifying diffusion strategies
4. Conducting needs assessments
5. Focusing upon specific target audiences
6. Identifying opinion leaders
7. Procedures for contacting opinion leaders
8. Utilizing opinion leaders to sustain diffusion
9. Evaluating effects of product on target audience
10. Evaluating diffusion strategies in relation to product impact on target audience

↓
↓

WOLF-WELSH LINKAGE METHODOLOGY (1979) - 9-STEPS

1. Attributes of persons apt to use the linkage methodology effectively.
2. Identification of a target audience's need to modify some aspect or aspects of professional practice.
3. Identification of products and/or practices apt to meet identified target audience's needs.
4. Selection of practices and/or products apt to meet identified target audience's needs.
5. Modification of practices and/or products selected to meet identified needs of targeted audience.
6. Determination of demographic characteristics and certain attitudes (toward the plan to modify some aspect or aspects of professional practice) of the targeted audience.
7. Conceptualization and implementation of strategies and tactics intended to incorporate designated practices and/or products within the professional practice of the targeted audience.
8. Part one: evaluation of the modification in practice.
   Part two: evaluation of the methodology.
9. Recommendations for improving upon the linkage methodology (Steps I through VIII) on the basis of evaluation results (offered by persons who used the methodology).

In Objective 1.1, Wolf's theoretical building blocks were broken down into a series of twenty-six major research generalizations. These generalizations represent the base of multi-disciplinary research knowledge on the diffusion and utilization of new educational products, practices and ideas.

Objective 2.1 addresses the need to compare recently-completed educational research know-how to these multi-disciplinary generalizations. It is believed that a comparison of the two sets of information will yield critical levels at which the variables and processes expressed in the multi-disciplinary generalizations are related to educational dissemination activities.

Objective 2.1 provides a clear and efficient framework for comparing and analyzing the two sets of information. Once again, procedures adopted from Rogers and Shoemaker (1971) provide one part of the framework. Educational studies which relate to each of the multi-disciplinary generalizations will be categorized by research type: empirical versus non-empirical.

Such a scheme should provide an effective means of locating what empirical work has been done and needs to be done to research the factor. Papers of contention, educational diffusion studies and advocacy studies of the factor can be clearly differentiated in this framework. Hence, distinctions between empirical and non-empirical educational sources will serve as one measure of determining the relatedness of the multi-disciplinary generalization to educational dissemination.

In addition, the total number of educational studies uncovered will be reported and the percentages of studies supporting, not supporting or

inconclusive to each of the generalizations will be computed. With the calculation of numerical and percentile distributions, the relationship between the multi-disciplinary generalizations and the related educational research can be more clearly seen.

Both the quality and quantity of educational studies which relate to each of the multi-disciplinary generalizations are summarized within the prodecures outlined to address Objective 2.1. Particular attention will be focused on empirical studies which either support or do not support the multi-disciplinary generalization. The scope and flavor of the educational studies pooled within the three research categories - support, no support or no pattern - as well as the gross number and percentile distribution of the studies within the categories should reveal comparative levels between the two sets of information.

Evaluation and summary of the results of the comparison will be guided by two factors raised within the educational dissemination literature:

- the sophistication or lack of sophistication of the educational research modus operandi; and
- the generalizability of the identified educational research evidence.

These overarching factors will be utilized to summarize and to make sense out of the array of studies organized and categorized under each multi-disciplinary generalization.

Hence, the outlined procedures should provide one method of testing the viability of the variables and processes identified in Wolf's dissemination "recipe." Other tests of Wolf's theoretical construct are possi-

ble and can be constructed according to purpose.

In summary, the following operations relate to the critical analyses of the educational literature:

- the total number of educational studies uncovered;
- the division of the educational studies into empirical and non-empirical categories;
- the percentile distribution of educational studies which support, do not support or are inconclusive to the generalization;
- the sophistication of research modus operandi utilized in the studies uncovered;
- the generalizability of the educational evidence uncovered.

OBJECTIVE 3.1 Indicate what research and development work must still be expedited in order to insure the appropriateness and viability of the Wolf-Welsh Methodology (1979) as a dissemination tool for the field of education.

Comparisons of the education-based evidence to the multi-disciplinary research generalizations will result in a base of knowledge related to the appropriateness and viability of the factors to educational dissemination. Significant gaps between the two sets of information will provide a map for future research and development work. Aspects of the diffusion/utilization phenomenon which require more sophisticated research treatment and aspects which have been neglected will constitute the bulk of research and development work identified under Objective 3.1.

Procedures employed to compare and to analyze the educational research evidence under Objective 2.1 will also serve as a means of identi-

fying gaps between the two sets of information. In these cases, further research and development work would be indicated in order to ascertain more complete evidence as to the relatedness of the factor to educational dissemination:

Case 1 - where generalizations are not supported by the educational evidence;

Case 2 - where generalizations have little support in the educational evidence;

Case 3 - where generalizations have inconclusive or contradictory support in the educational evidence;

Case 4 - where generalizations are supported by educational evidence which is questionable as to research treatments.

Hence, the scope and structure of suggested research and development work relate to the results of the critical analyses of the educational literature. From these results, four distinct cases are presented as general frameworks to guide further research into the variables and processes expressed in the twenty-six multi-disciplinary generalizations. Specific proposals for further research are presented in Chapter V.

In summary, the scope and sequence of modus operandi, designed to address the three specific objectives of this study have been presented:

- a specific dissemination tool is chosen for examination (Wolf-Welsh Linkage Methodology, 1979);
- the development and background of the tool is explained;
- the multi-disciplinary research background of the tool is analyzed;
- the theoretical building blocks are identified (Wolf, 1974);

- the theoretical building blocks are reduced to a series of twenty-six research generalizations;
- a review of educational research sources is conducted;
- three categories are related to each generalization: support, no support, inconclusive;
- educational research studies are reported for each of the generalizations within these categories;
- the educational research studies are further categorized by type: empirical or non-empirical;
- the total number of studies related to each generalization is reported;
- the percentage of studies supporting, not supporting or inconclusive is reported;
- each generalization is evaluated according to the strength of the educational evidence uncovered;
- the strength of evidence is based on the sophistication or lack of sophistication of research modus operandi designed to address the factor;
- from these analyses are derived a series of suggested research activities related to the generalizations;
- recommendations are offered regarding factors of importance in educational dissemination, modifications of the Wolf-Welsh Linkage Methodology and to the construction and development of other linkage tools.

C H A P T E R IV

Data offered for analyses in Chapter IV are organized in accordance with the conceptual scheme reported in Figure C of Chapter III. Each of the twenty-six research-based generalizations which have been gleaned from the multi-disciplinary diffusion research literature is addressed within this context.

Part I, the Linkage Agent, of the Wolf-Welsh Linkage Methodology is summarized by five multi-disciplinary research generalizations:

1.1 Successful linkage enterprise is positively related to certain behavioral characteristics (i.e., reliability, ability to listen, punctuality, etc.) of the person or persons responsible for the linkage enterprise.

1.2 Successful linkage enterprise is positively related to the effective utilization of certain professional expertise (i.e., needs assessment expertise, communication expertise, evaluation expertise, etc.) by the person or persons responsible for linkage enterprise.

1.3 Successful linkage enterprise is positively related to the degree of compatibility between the professional background and demographic characteristics of the typical member of a targeted audience.

1.4 Successful linkage enterprise is positively related to the amount of time invested by a person or persons in linkage enterprise.

1.5 Successful linkage enterprise is positively related to the extent to which the person or persons responsible for linkage enterprise have experienced such success in the past.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the first overarching variable, the Linkage Agent. And second, specific educational research outcomes are categorized according to whether they support, do not support, or are inconclusive with regard to each of the five generalizations related to the Linkage Agent, Part I, of the Wolf-Welsh Linkage Methodology (1979).

Thus, information in this section is presented in the following order:

1. perspectives on the research on the Linkage Agent;
2. review of specific research studies related to Part I, the Linkage Agent, of the Wolf-Welsh Linkage Methodology;
3. interpretation of data: Generalization 1.1 (behavioral characteristics);
4. interpretation of data: Generalization 1.2 (professional characteristics);
5. interpretation of data: Generalization 1.3 (compatibility with target audience);
6. interpretation of data: Generalization 1.4 (time invested);
7. interpretation of data: Generalization 1.5 (past success);
8. summary of the data related to Part I, the Linkage Agent.

Perspectives on the research on the linkage agent. A review of various educational research studies which focused on the development of the educational linkage model and linking agent role revealed the following major generalizations:

1. Federal support of RD & D approaches to school improvement resulted in the production of numerous programs, practices and products during the 1960's and early 1970's (Bank et al, 1979).
2. Despite these efforts, it was obvious that new roles, functions, relationships and channels of communication between user and resource systems were necessary in order to insure adoption of these R & D programs, practices and products.
3. New theories and research evidence related to the target audience's resource utilization needs and behaviors altered traditional diffusion/utilization assumptions regarding school improvement.
4. Evaluation of the relationships between resource and user systems convinced many researchers of the need for an "intermediary" agent or team to assist users in problem identification and resource utilization.

The emergence of the linking agent role owes much to federal research and development efforts of the 1960's and early 1970's. School improvement was related to the need for better information - information related to educational research and information related to programs, practices and products which incorporated such research. Units of change - states (SEAs), districts (LEAs), schools or individual teachers/administrators - were viewed as information-seeking and change-oriented - that is, presented with better programs, practices, products, techniques or ideas, they would adopt them. Bank et al (1979) have pointed out that school improvement was viewed primarily as a logical and sequential process... "starting with the production of new knowledge by researchers, the incor-

poration of that knowledge into products or programs by developers, the evaluation of those products or programs by evaluators, and their dissemination to schools by disseminators (pp. 4-5)."

However, numerous studies have detailed and described the difficulties related to the dissemination and implementation of educational innovations in order to improve school practice (Carpenter-Huffman, Hall and Sumner, 1974; Berman et al, 1975; Sieber, 1972; Robinson, 1973 and Fleming, 1978). Bank et al (1970) noted that dissemination strategies utilizing printed material, ERIC, audiovisual materials and replicable R & D products failed to influence school practice as anticipated. Referring to a study conducted by the Board of Social Science Research in 1968-69, the authors reported that:

> Having the information available in printed form did not result in schools obtaining the information, and obtaining the information did not result in its use (pp. 13-14).

Albers (1967) suggested that lack of information was only a part of the practice improvement problem:

> At a recent series of meetings - involving more than 250 staff members of nine elementary, junior and senior high schools - we found a serious lack of knowledge about recent educational innovations. There was disturbing evidence of apathy, also (p. 197).

Evaluations of the traditional channels of educational research communication - journals, books, papers, NDEA summer institutes, regional conventions and inservice workshops as well as other information-sharing and disseminating strategies of the 1960's and early 1970's convinced many researchers of the need for a linkage agent role (see Havelock, 1969; Wolf, 1972; Leary, 1969; Gulesian, 1970; Sieber, 1972 and Havelock and

Lingwood, 1973).

Reports of the knowledge-utilization needs and behaviors of potential users provided additional support for the linkage function as an "intermediary" role (see Lippitt, Watson and Westley, 1958; Bhola, 1965; Havelock, 1969, 1971, 1973a; Piele, 1975; and Bank et al, 1979).

Hood (1973) analyzed practitioner modus operandi in seeking and using R & D information:

> Generally, practitioners require relatively small amounts of information from a large, highly diverse body of information and usually have seriously restricted time for gathering and using it. Compounding this problem is the fact that practitioners have had relatively little formal training in information search and retrieval. Moreover, the cultural and social systems of educational practitioners provide relatively few rewards for R & D information use; hence, motivation for seeking and use is generally low (p. 101).

Wolf (1973) extended this view through his observation that:

> An educator's position in the field will dictate the nature of much printed material that is aimed to his direction. Affiliation with selected structured groups will account for additional materials received (p. 8).

In a later analysis of Sieber's Pilot State Dissemination Program (1972), Piele (1975) found:

> Interestingly, the assistance of the agent seemed to be valued more than the information, and interpersonal contact was considered more useful than printed information (p. 68).

Hence, problems and processes associated with education's traditional channels of communication and methods of interaction between resource and user systems provide one means of understanding the evolution of the linkage agent role.

Much, if not all, of the current interest in linkage roles and functions can be traced to the early work of Bhola (1965) and somewhat later, to the comprehensive work of Havelock (1969; 1971; 1973a; also see Havelock, Waltz and Shaw, 1973 and Havelock and Lingwood, 1973).

To succintly summarize Havelock's conceptual and analytical contributions to linkage know-how and the linkage agent role is difficult. However, Havelock's view on "macro-system linkage" and the relationship within and between knowledge resource systems and knowledge user systems (Hood and Cates, 1970, p. 41) seem integral to his widely quoted Linkage Process Model. Hood and Cates (1978) have summarized the major aspects of the Linkage Process Model (Havelock and Lingwood, 1973) as a model consisting of four parts:

> This model is conceptualized in terms of four components: the client or user system, the knowledge or resource system, a needs processing system and a solution processing system. The first two of these components are both problem-solving systems, whereas the last two components represent the dialogue (linkage processes) between the two problem-solving systems. For Havelock and Lingwood, the concept of linkage starts with the user as a problem-solver who is helped to learn a problem-solving cycle made up of initially felt need, diagnosis, problem statement, search, retrieval, solution fabrication and solution application phases. However, the linkage process model stresses that the user must be meaningfully related to outside resources. To accomplish this, the user must enter into a reciprocal and collaborative relationship with an interactive resource system capable of maintaining reciprocal feedback between the user and resource system ...the model is actually intended to apply at micro-meso-, and macro-system levels. Linkers are expected to develop reciprocal and collaborative relationships, not only with potential users, but also with a large and diverse group of other resource systems (pp. 41-42).

Applications of Havelock's conceptual efforts (see Havelock and Lingwood, 1973; Evers, 1979; Duncan, 1978; Lavin, 1974; Lindquist, 1974; Havelock and Havelock, 1974 for example) and Sieber's (1972) work on state pilot programs helped to develop the linkage agent role. Federal interest and support for linkage activities has also increased. Bank et al (1979) have pointed to a shift in federal policy resulting from reorganized theories of school improvement and new perspectives on schools as units of change:

> Originally, dissemination was thought of in traditional marketing terms, that is, a demand for newly created R & D products, often attractively packaged by publishers, had to be stimulated. Schools must be convinced of their needs for these new products, either through scientific evidence that the products 'worked' elsewhere, or through more traditional advertising. Successful dissemination was measured by sales figures. Recently, the federal perspective has shifted. Rather than being viewed as customers to be sold, schools and school districts are regarded as clients to be serviced. Disseminators, that is, middlemen allied with the producers of products and services have been transmuted into linkers, that is, middlemen allied with the consumers of products and services (pp. 4-5).

Review of Specific Research Studies Related to Step I, The Linkage Agent, of the Wolf-Welsh Linkage Methodology 1979). Part I, the Linkage Agent, of the Wolf-Welsh Linkage Methodology (1979) is a step designed to address important characteristics of the person or persons responsible for linkage enterprise. As such, the LINKAGE AGENT step (1.0) is prescriptive to potential users of the Methodology - that is, linkage agents - who aspire to bring together the world of knowledge production and the world of knowledge utilization.

Four factors - personal characteristics (1.1); professional expertise

(1.2); amount of time invested (1.4); and past experience and success (1.5) are related to linker performance. Generalization 1.3 addresses the one interactive factor related to linkage agent characteristics - the degree of compatibility between the demographic and professional characteristics of the linkage agent and the demographic and professional characteristics of members of the target audience.

Assumptions as to the role and function(s) of linkage agents are implied in all of the generalizations except Generalization 1.3 which addresses the stability of linking agent performance across diverse educational settings and target groups. The generalizability and completeness of the educational research evidence bearing on these five factors has major implications for the selection, training, location and support needs of linkage agents.

For example, if there are identifiable personal attributes which insured more effective linkage agent performance, preparation programs and in-service training for linkage agents could utilize such descriptive data in the selection of potential linking agents. Training geared to the development of these interpersonal skills could also be featured. Linkage agents already in the field could rely on such evidence as a method of self-verification and feedback - thus, enhancing the likelihood that they would be more successful in their interpersonal activities with practitioners (users).

Unfortunately, attempts to show the primacy of function of one factor or another in linkage agent performance are beset with a number of conceptual dilemmas. Four distinct, yet inter-related factors, account for these problems:

1. the embryonic and developing state of the role, agents and agencies responsible for linkage activities (see Hood and Cates, 1978);
2. the complexity of the linkage agent role definition and function across diverse educational settings and target groups (see Bank et al, 1979; Piele, 1975; Cates, 1978; Crandall, 197; Culbertson, 1977; Rosenau, 1977; Butler and Paisley, 1978; Hood and Cates, 1978; and Wolf, 1980);
3. the lack of empirical investigation or evidence related to the linkage agent role and function (see Piele, 1975; Crandall, 1977; Hood and Cates, 1978; Cates, 1978; and Wolf, 1980);
4. the poorly-developed state of most training and support systems for linking agents which are based on assumptions and concepts unrelated to the actual tasks and functions of most linking agents (see Wolf, 1977; and Hood and Cates, 1978).

As a result, attempts to organize and synthesize educational research know-how on the linkage agent role and function are handicapped by these four major aspects of the educational research literature.

A computer scan of the ERIC system in March, 1980 identified approximately 150 studies from 1975 to the present which pertained to the major ERIC descriptors - LINKAGE AGENT/INFORMATION DISSEMINATION/CHANGE AGENT. Previous to 1975, linker/linking/linkage agent references were fewer. Obviously, researchers have been turning their attention to linkage enterprise in recent years. It is believed that this trend will continue to be seen, not only in ERIC, but in other educational research sources as well.

A review of these ERIC studies in light of the present investigation

proved to be difficult. First and foremost among the problems encountered was the dearth of empirical evidence which could be found that related to the five multi-disciplinary research generalizations. Various studies purported empirical dimensions, but relatively few, if any, could reasonably be classified as rigorous. Most of the studies reviewed were lengthy, theoretical conceptualizations or reconstructions of linkage agent functions or training needs. Hood and Cates (1978) echo the generalizability problem as well as the lack of empirical investigation:

> Indeed, in the absence of empirical evidence, such reconstructions are necessary to guide the mind in coping with an as-yet intangible reality. Rather, the difficulty lies in generalizations drawn from the models that are applied to planning as if they were derived empirically and thus have predictive power instead of being viewed as generalizations to be submitted to empirical examination (p. 61).

Unquestionably, the need for better information regarding the role, functions, training and support of linking agents is an overarching concern expressed in the major reviews of linkage know-how - Piele (1975); Nash and Culbertson (1977); Crandall (1977); Rosenau (1977); Butler and Paisley (1978); Cates (1978); Hood and Cates (1978); Bank et al (1979) and Barth (1979).

According to Piele (1975):

> There is a considerable evidence in the change-diffusion literature which suggests that innovations (new ideas or products) spread more effectively when their diffusion is facilitated by a person or team functioning as a linking agent (p. 7).

However, Piele points out that beyond this certainty, not much is known:

> ...clearly any linkage model being discussed is likely to lead to more effective resource utilization than would take place in the absence of an agent. What are needed are rigorous comparative studies to determine

> which type of agent role are most effective under which circumstances. Work on state pilot programs has made a start in this direction, but more extensive and systematic comparisons need to be made (p. 77).

Piele's efforts in 1975 to summarize the educational research literature on linkage roles and processes resulted in his further assessment that:

> ...there is a distinct shortage of empirical research material; and the work that has been done has reached conclusions that are either tentative in nature or dubious in their applicability (p. 65).

Piele concluded that many questions were unanswered, and in some cases, unasked (p. 77). It is not unreasonable to believe, that work completed since 1975 would address many of the problems and causes of problems identified by Piele. Unfortunately, this is not the case.

Of the major reviews already identified, Hood and Cates (1978) and Cates (1978) seem most succinct in appraising three key issues, and some tentative answers, which have emerged from research and development work completed since 1975. The issues identified by these researchers pertain to the (1) relationship between specific training and linkage agent functions; (2) internal versus external linkage agent status; and (3) the relative importance of the functions for program improvement or related skills. Cates (1978) states that there is inconclusive evidence related to all three major issues and further, that findings reported in Crandall (1977), NDN-TAB, Capla (1977) and Rosenau (1977) are either "conceptual, experimental estimates or based on data applicable to a single program or project or gathered from such a limited number of sources that they cannot be generalized with any sense of accuracy (p. 15)."

Thus, research problems and perspectives identified by Piele (1975) continue to challenge educational researchers. Two major research summar-

ies (Cates, 1978 and Hood and Cates, 1978) support this view.

Despite such seemingly slow research progress on the linkage agent role, hope exists in a new research perspective that has been noted by a few researchers recently. Hood and Cates (1978) have called for more field-based, and less theoretical, approaches to the problem:

> ...most training programs and support systems have been based on logical analysis and general assumptions about what would or should be needed, often with only a very general understanding of actual task demands and critical problems linking agents would encounter. If effective training and support systems are to be developed and maintained, there must be more field-based, reality-oriented, intensive study of linking agents, their clients, and the embryonic agencies and systems that now exist (p. 10).

Wolf (1977), for example, reviewed and analyzed eleven programs designed to train educational linking agents. Six of the programs evolved within university settings, four within USOE initiated regional educational laboratories, and one within a state education agency context (p. 5). According to Wolf, little evidence exists to support the aspirations of the eleven programs to train linking agents for a variety of user needs or settings. Diverse operating assumptions, length of training and general program approaches to linkage agent training appear to support Wolf's recent assessment that:

> Not enough know-how has been accumulated by researchers yet to meaningfully guide the performance of persons engaged in linkage enterprise. Linkers often aren't sure why they succeed or why they fail (Wolf, 1980, p. 15).

Synthesizing the challenge of Hood and Cates (1978) and the reviews of linkage know-how of Wolf (1977; 1980) provides a strong argument for the utility of methodology towards understanding linkage enterprise.

Methodology examined in the present study (Wolf-Welsh Linkage Methodology, 1979) is an example of a tool capable of providing useful data on linkage enterprise (1) over time; (2) across diverse educational settings; and (3) with different agents, target audiences and innovations. Significant field-based data could be generated through the application of such a methodology and would provide a means of conceptualizing and testing the linkage role more realistically as well as empirically.

Hence, previous, and subsequent, review and analyses of educational linkage know-how related to the major theoretical framework of the methodology gains significance in light of research needs expressed in the related literature.

Interpretation of data - Generalization 1.1 (Behavioral Characteristics). Generalization 1.1 relates successful linkage enterprise to certain behavioral characteristics (i.e., reliability, ability to listen, punctuality, etc.) of the linkage agent. Logically, much if not all linkage agent success might be related to the interpersonal skills utilized by the agent. The relationship between such personal linker attributes and linkage enterprise is seemingly implied in specific linkage roles and functions - particularly those of "process helper" and "solution giver" identified by Piele (1975). In fact, the "intermediary or middleman" role widely advocated and described in the educational research literature would seem to imply interpersonal skills important to the functions of linkage between the world of knowledge production and the world of knowledge utilization.

Despite such general references in the literature, few studies could

be found which treated these factors with any depth and no studies were located that offered any empirical evidence. Most direct, yet largely descriptive references, were put forth by Havelock (1973a) in The Change Agent's Guide to Innovation in Education and Walz and Benjamin (1977) in On Becoming a Change Agent. Both works offer practical as well as conceptual guidance to persons providing linkage services.

Interpersonal methods and the frequency of interaction between linkage agent and target audience were mentioned by a number of sources as important to linkage success (Emrick, Peterson and Rogers-Agarwala, 1977; Emrick and Peterson, 1978; and Paul, 1977). Problems of implementation surfaced as a major woe in a report by Berman et al (1975). Each of these studies characterized the role played by interpersonal factors in linkage and school improvement - yet, none of the studies related any behavioral characteristics to specific linkage agent success. Interpersonal methods of training and linker-user communication were highlighted in the most rigorous study identified (Emrick, Peterson and Rogers-Agarwala, 1977):

> For example, training programs that are coordinated with facilitator operations, that are most focused and specialized (i.e., less comprehensive or overwhelming), and that are more personalized in character (i.e., more emphasis on interpersonal methods, less on materials) are more likely to lead to successful adoption. On the other hand, formalized or 'routinized' training appears least successful, most often leads to non-adoption or to implementation problems and subsequent discontinuation, and tends to be negatively evaluated by LEA staff (p. 89).

Numerous field studies and reports support this view - that interpersonal variables and channels of communication are primary factors in the successful adoption and implementation of educational innovations. Unfortunately, however, little attention is paid to exactly which behavioral

factors successful linkers might have in common or what consequences specific preparation and training have on the development of these attributes. Hence, successful linkage agent enterprise seems more of an art and less of a science.

Figure 1.1 displays the results of the literature review conducted for the purpose of identifying and categorizing educational research pertinent to the generalization. Whereas a comprehensive scan of relevant literature was conducted, it is conceivable that references/data related to the factor exist beyond those reported.

Despite these constraints, it is believed that the studies and analysis of the factor present a representative picture of what is known about the relative importance of certain behavioral characteristics of the linkage agent.

FIGURE 1.1

Generalization 1.1 Successful linkage enterprise is positively related to certain behavioral characteristics (i.e., reliability, ability to listen, punctuality, etc.) of the person or persons responsible for linkage enterprise.

Support: Lippitt, Watson and Westley (1958), Bennis (1969), Sieber (1972)*, Havelock (1973), Piele (1975), Berman et al (1975)*, Dissemination Analysis Group (1976), Educational Dissemination and Linking Agent Source Book (1976), Paul (1977)*, Emrick et al (1977)*, Butler and Paisley (1978), Emrick and Peterson (1978)*, Cates (1978), Springfield and Anderson (1979).

Percentage of studies supporting the generalization: 100%
Number: 14

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive : 0

Number: 0

Total number of studies identified: N = 14

Total number of empirical studies: N = 4 (all categories)*

Total number of non-empirical studies: N = 10 (all categories)

At present, no definite recipe exists which would help a linkage agent know which specific personality (behavioral) variables would be pre-eminent in successful linkage enterprise. Figure 1.1 shows that various literature sources are in agreement that interpersonal dynamics are operative in linkage enterprise.

Common sense and strong inference support the importance of punctuality, reliability and listening ability to linker success. Such behavioral characteristics are implied in the numerous linkage agent functions identified by researchers. Organizational ability, openness, flexibility, patience and tenacity are listed as other examples. Piele (1975) reviewed findings submitted from Sieber's pilot state program (1972). Sieber offered the following advice:

> 'Agents should be non-authoritarian, patient, able to tolerate delay and frustration, with low needs for ego-aggrandizement, the capacity for working with a wide variety of people, good communication ability, and, above all, the ability to adapt to different situations and individuals. In addition, whether the agent is male or female seems to be an irrelevant factor' (p. 68).

In another source, linker/facilitator skills, thought to be of consequence, to the different products identified in the report (Educational Dissemination and Linking Agent Sourcebook: A Collection of Product Resources, 1976) are listed as:

> Consultation Skills, Organizational Development, Theory and Research Change, Intervention, Diagnoses, Data Gathering, Design Skills, Interviewing Skills, Knowledge - R & D Products, Moral and Ethical Issues, Communication Skills, Problem-Solving Skills, Entry Skills, Conflict Utilization Skills, Termination Issues, Systems Technology, Confrontation Skills, Information Retrieval, Group Process Skills (p. 21).

Key elements in successful linkage according to Sieber (1973) were the "interpersonal linkage role of extension agents and accessibility to a national base for educational problem-solving (p. 88)." Sieber stresses that the agent's main contribution "lay in encouraging and sustaining the interest of clients in utilization rather than in obtaining better information or in helping them understand the information (p. 93)."

Five tactics utilized by Sieber's extension agents illustrate day-to-day linkage activities and suggest support for reliability and organizational abilities of linkage agents:

> (1) using the system (e.g., identifying opinion leaders and self-starters to extend the agents' impact, working with school committees, and setting up inter-school visitations to spread innovations;
> (2) delegation of certain responsibilities, such as delivery of information prior to follow-up;
> (3) systematic record keeping of the status of all requests;
> (4) timing input and output interaction according to different phases of the school year; and
> (5) organizing several agents into a team so that the case load could be shared (p. 91).

Communicating (Dissemination Analysis Group, 1976) is universally mentioned as both a personal and professional function of linkage agents. Distinctions as to what constitutes a "good communicator" - or, for that matter, a "reliable, sensitive listener" make Generalization 1.1 a thorny issue, however.

Springfield and Anderson (1979) report that high visibility at school sites and listening and responding to simple user needs are important for linkage agents. The authors also note that "being on time, being prepared, and being responsive, but not pushy" will aid linkage agents in gaining entry into a school district (pp. 11-12).

Results of the present investigation reveal that little research attention has been paid to specific behavioral characteristics of linkage agents. Studies reviewed illustrate efforts to conceptualize the linkage agent role in relation to behavioral characteristics. Reliability, flexibility, patience, punctuality, organizational ability and listening ability are frequently-mentioned examples of these traits. No definite listing was found in the literature or implied in Generalization 1.1.

Interpretation of Data - Generalization 1.2 (Professional Characteristics). Generalization 1.2 addresses the relationship between the effective utilization of certain professional expertise (i.e., needs assessment, communication, evaluation expertise, etc.) to successful linkage enterprise. It is believed that specific trining and experience in these skill areas increases the likelihood that the linkage agent will be successful in diagnosing and assisting users in adoption/implementation problems. Hence, Generalization 1.2 assumes that linkage tactics employed by agents can be analyzed and broken down into a set of practical skills which are common to successful linkage enterprise.

Strategic assumptions about school improvement and change underlie the relationship between professional expertise and linkage enterprise according to a number of sources scanned (Lippitt, Watson and Westley, 1958; Piele, 1975; and Butler and Paisley, 1978 for example). In this view, specific professional expertise and training are related to overarching considerations. Piele (1975) has identified three:

1. the relationship of the agent to the client and resource system;
2. the extent of training each role demands;

3. and particularly; the locus of primary responsibility for innovation adoption.

Lippitt, Watson and Westley (1958) have written that skills employed will vary widely depending on how the agent views the client system and the final change goals. In a recent report, Butler and Paisley (1978) offer two dimensions which relate to linker strategies and interactions between agents and users:

> One dimension involves the intra-organizational versus extra-organizational locus of linkage activity. The other dimension involves the linking agent's 'entitlement' to act on behalf of the organization in different ways. The concept of 'entitlement' accounts for marked differences in the approach of linking agents to clients and the nature of the ensuing exchange. The concept is an amalgam of expectation, legitimation, auspices, functions, and an additional factor that is best described as the linking agent's presentation of self (p. 1).

In addition, two distinct conceptualizations of the importance of specific professional expertise were uncovered in the educational research literature.

The first view maintains that a common series of linker tasks exists which are defined by a common vocabulary (Bank et al, 1979 pp. 20-21). Priorities for training of linkage agents assume this view also (see Havelock, Walz and Shaw, 1971; Banathy et al, 1972; Mick et al, 1973; and Sieber, 1972). Generally, these linker skills are related to overarching tasks which experience has shown most linkers perform. Needs assessment, information acquisition, and planning and training activities are highlighted.

Numerous studies support this first view in which the linkage agent is seen as possessing specific expertise (needs assessment expertise, com-

munication expertise, evaluation expertise, etc.) relevant to linkage tasks and success. Generalization 1.2 derives from this conceptualization.

A second view of the relationship between professional expertise and linker success has emerged and challenged the first view. In the second view, linkage agent success may relate more to target audience and school district variables (see Generalizations under 2.0 Conditions for Change and 4.0 Target Audience related to this point) than to linker performance or expertise (see Firestone and Corbett, 1979; Pincus, 1974; Hayman, 1979 and Hughes, 1971). Thus, stability of performance may be related to factors beyond the control of the linker or his/her professional expertise (Wolf, 1980 p. 13).

Hood and Cates (1978) have stated that not enough is known to determine (1) any clearcut relationships between linkage agent training and function; (2) internal versus external linkage agent status; or (3) the relative importance of functions for program improvement or related skills (p. 15).

The present investigation encountered many sources which advocated the general skills expressed in Generalization 1.2 as well as additional ones. Contradictions within the related literature as to the primacy of linker expertise and performance across different target settings versus client/school district variables emanate from one central problem: not enough evidence has accumulated yet to insure the generalizability of any single factor to linkage agent success.

Figure 1.2 displays studies related to the professional characteristics of linkage agents. Unfortunately, despite the overwhelming advocacy

for linkage agent expertise; there is a wide span of opinion regarding exactly which skills are most necessary, in which settings, and how best to insure that perspective linkage agents acquire them. Most of the studies advocate skills or training - few report relationships between these skills/expertise and successful linkage enterprise as stated in Generalization 1.2.

FIGURE 1.2

Generalization 1.2 Successful linkage enterprise is positively related to the effective utilization of certain professional expertise (i.e., needs assessment expertise, communication expertise, evaluation expertise, etc.) by the person or persons responsible for linkage enterprise.

Support: Lippitt, Watson and Westley (1958), Howsam (1967), Baker (1967), Furbay et al (1969), Havelock, Walz and Shaw (1971), Banathy et al (1972); Sieber (1972;* 1973), Mick et al (1973), Havelock (1973), Piele (1975), Dissemination Analysis Group (1976), Nash and Culbertson (1977), Paul (1977),* Butler and Paisley (1978), Bank et al (1979).

Percentage of studies supporting the generalization: 64%

Number: 16

No Support: None

Percentage of Studies not supporting the generalization: 0

Number: 0

Inconclusive: Hughes (1971), Wolf (1977; 1980), Crandall (1977),* Emrick et al (1977),* Cates (1978), Hood and Cates (1978), Hayman (1979), Firestone and Corbett (1979)*

Percentage of studies which are inconclusive: 36%

Number: 9

Total number of studies identified: N = 25

Total number of empirical studies: N = 5 (all categories)*

Total number of non-empirical studies: N = 20 (all categories)

The research which has been done fails to provide strong empirical correlations necessary to establish a base on which to build cause-effect principles related to linkage agent expertise or training. Such correlations probably exist. Other factors may play an important part also. Researchers seem to be on the right track - only more linkage agent experience and the evaluation of selected training and methodological approaches to linkage activity will reveal more generalizable know-how.

Like Generalization 1.1, it is believed that the studies and research issues identified portray a fairly representative picture about what is presently known about the relationship between linkage agent expertise and successful linkage enterprise. Categorizing and making sense out of the array of studies, training programs and field reports represented in Generalization 1.2 proved frustrating. In many cases, it was necessary to arbitrarily assign advocacy since the language and implications of the sources did not match those in the generalization. Such a problem situation exists throughout the linkage agent literature.

Paul's effort (1977) to tease some logical generalizations out of the linkage agent literature encountered similar difficulties. Studies cited as "inconclusive" in Figure 1.2 generally argue for the consideration of target audience variables, central office characteristics, internal linkage agents or other variations related to explaining linkage agent expertise and success. Thus, they do not necessarily state that there is no relation between linkage skills and success. Neither do all of the studies organized to show support for the Generalization provide a clear and generalizable sense that certain professional expertise is related to successful linkage enterprise.

Hence, procedures designed to address the relationship between certain professional expertise and successful linkage enterprise revealed wide-scale belief that expertise was needed. Some studies argued that successful as well as unsuccessful linkage enterprise occurs as a result of factors unrelated to the linker's skill or training. Emrick, Peterson and Rogers-Agarwala (1977) offer the most empirical explanation of what may be important to the issues presented. Their evaluation focuses on the importance of interpersonal assistance to LEAs in innovation/adoption, yet emphasizes the role of practitioner-developed, yet externally validated, innovations. Linkage agent tactics are based "on the assumption that the needs and interests of users vary and, accordingly, that the resources most appropriate to serving these interests also vary (p. 32)." Hence, their findings serve as one piece of evidence that further research should explore. Such a "middle range" view takes into account the discrepancies and controversies surrounding linkage agent success and expertise - and that agent expertise as well as target audience/school district variables need to be considered as a total unit in order to explain successful linkage.

Such linkage dynamics are expressed in Generalization 1.3.

Interpretation of Data - Generalization 1.3 (Compatibility with members of the Target Audience). Generalization 1.3 states that successful linkage enterprise is positively related to the degree of compatibility between the professional background and demographic characteristics of the person or persons responsible for linkage enterprise and the professional background and demographic characteristics of the typical member of a

targeted audience. Hence, linkage agents who share norms, values and backgrounds similar to members of a target audience increase the likelihood they will develop compatible relationships, and thus, will be more successful in linkage activities.

Figure 1.3 displays studies uncovered that relate to the generalization. Most sources surveyed stressed the importance of developing compatible relationships between agent and user. Havelock (1973a), Sieber (1972) and Walz and Benjamin (1977) all offered perspectives on the development of mutually-compatible relationships between linkage agents and users. No studies were uncovered which challenged the efficacy of this multi-disciplinary factor to educational dissemination.

However, the bulk of support in the educational literature was offered from two non-empirical categories: papers of contention or advocacy and case studies describing past efforts. That no significant body of empirical evidence could be found raises questions as to the generalizability and completeness of the research.

Walz and Benjamin (1977) state that "if the advocated of change possess background similar to those of the client system, the probability of adoption increases (pp. 51-42)." Hayman (1979) views the compatibility factor as crucial to change efforts and utilizes this aspect to argue for internal linkage agents:

> There has been a lot of talk in recent years about 'dissemination' and 'diffusion,' and much of the thinking about these processes in education has been drawn from the agricultural extension agent model. A lot of the 'change agent' role conceptions have been drawn from this model; that is, change agents have been conceived as 'external' linkage agents (p. 18).

According to Hayman (1979), "information is more likely to be accepted and used if the user perceives the supplier as sharing the norms, values, and sub-culture of the organization (p. 16)." Thus, Hayman concludes that the linker should come from within the organization (p. 17).

Whether internal linking agents are more effective than external linking agents is not known. Little research evidence was discovered which would conclusively support either internal or external linkage agent status. It is believed that such role and function distinctions are related to compatibility aspects of the linkage agent.

Questions raised as to the importance of the compatibility between linkage agent and members of a target audience are central to understanding the processes and influences of educational improvement and change. In a recent analysis, Wolf (1980) compared findings of Firestone and Corbett (1979) and Emrick and Peterson (1978). The two studies reported different outcomes related to the stability of linkage agent performance across settings and over time according to Wolf (1980, p. 14).

It is believed that such divergent outcomes illustrate research problems related to compatibility issues. Therefore, despite unanimous support for the factor (see Figure 1.3), interpretation of the data presented reveals that much more needs to be known about compatibility aspects of linkage enterprise.

FIGURE 1.3

Generalization 1.3 Successful linkage enterprise is positively related to the degree of compatibility between the professional background and demographic characteristics of the person or persons responsible for linkage enterprise and the professional and demographic characteristics of the typical member of a target audience.

Support: Lippitt, Watson and Westley (1958), Chin (1967), Baker (1967), Sieber (1972;* 1973), Havelock (1973a), Carpenter-Huffman, Hall and Sumner (1974), Piele (1975), Walz and Benjamin (1977), Paul (1977),* Emrick and Peterson (1978),* Springfield and Anderson (1979), Hayman (1979).

Percentage of studies supporting the generalization: 87%

Number: 13

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: Firestone and Corbett (1979),* Wolf (1980)

Percentage of studies which are inconclusive: 13%

Number: 2

Total number of studies identified: N = 15

Total number of empirical studies: N = 4 (all categories)*

Total number of non-empirical studies: N = 11 (all categories)

Interpretation of Data - Generalization 1.4 (time invested). Generalization 1.4 relates successful linkage enterprise to the amount of time invested by a person or persons in linkage enterprise. Difficulties associated with educational innovation/adoption, particularly installation/implementation problems (see Berman et al, 1975), would seem related to the amount of time invested by a linkage agent.

Most of the recent conceptualizations of linkage roles (see Havelock in Eidell and Kitchell, 1968, 1969; Havelock, 1973a; Piele, 1975; Crandall, 1977; and Butler and Paisley, 1978) imply varying amounts of time necessary for the performance of linkage functions. Six, of the seven systematic models of change, identified and described by Hood and Cates (1978) imply time-status distinctions:

> The first two models (RD & D and Social Interaction Diffusion) emphasize the dissemination and use of externally developed knowledge (programs and products) by large numbers of potential users. Agents associated with these models must thus be concerned with reaching and influencing many clients, and usually cannot afford to spend much time with individual clients. ...By contrast, the next four models (Problem-Solving, Therapeutic-Intervention, Planned Change, and Action Research) are not appropriate unless the agent is able and willing to spend significant amounts of time with specific clients (individuals, groups, or organizations)(p. 42).

Hence, different models of change directly influence the amount of time invested by a linkage agent. Piele (1975) noted that the locus of primary responsibility for innovation/adoption influences many aspects of what linkage agents do (p. 29) .

Empirical references to the amount of linkage agent time invested were few. Paul (1977), however, provided the most focused and empirical attention to the factor. Two major research generalizations gleaned

from Paul's study relate to time invested:

> 1. A Mutually Agreed Frequency of Face-To-Face Interaction Will Help To Optimize the Effectiveness of Helping, Training, Or Conveying Activities [Moderately Speculative].
> 2. Each Individual School Has Its Own Optimal Frequency of Interaction Curve Which Varies Frequently [Speculative] (p. 42).

Paul summarized his findings in the research by relating time invested to target audience variables. Attention to these differences from school to school is most important according to his sources (McKeigue, 1976; Paul, 1974; Tushingham, 1974; and Wyner, 1974):

> The curvilinear relationship between the frequency of interaction and the effectiveness of the interaction is partly a function of the status and needs of a school which vary over time and from school to school (p. 43).

Implications from Paul's study illustrate the empirical tentativeness with which the research literature treats the amount of time invested by the linkage agent.

Efforts to uncover recently-completed work on time invested by linkage agents produced little evidence. In a similar way, Cates (1978) found only indirect attention to the factor:

> Little direct or specific attention has been given to requirements for a performance of roles and functions which may be due to the full-time or part-time status of a linking agent. However, Butler and Paisley (pp. 39-41) considered this factor indirectly in their discussion of the linking agent's location and implications for training and support systems. The critical distinction they make is that full-time linking agents perform both the role and functions whereas the part-time agents perform the functions only, and integrate the linking functions with their nominal other full-time roles. They also relate (the present) part-time status to the internal location and (the present) full-time status to the external location, but indicate that in the future internal linkers also may be

> full-time. By associating the external location with the full-time status and the internal location with the part-time status, they imply that distinctions among functions in linker locations may be confounded with differences in linker time status (p. 36).

Hence, few research sources were discovered which related to Generalization 1.4. General support was noted for having adequate opportunities to work on user problems (Havelock and Lingwood, 1973 for example). And Paul's (1977) empirical work raises more questions than it answers.

FIGURE 1.4

Generalization 1.4 Successful linkage enterprise is positively related to the amount of time invested by a person or persons in linkage enterprise.

Support: Fox and Lippitt (1964), Chin (1967), Sieber (1972),* Carpenter-Huffman, Hall and Sumner (1974), Piele (1975), Berman et al (1975),* Welsh (1976), Emrick and Peterson (1978).*

Percentage of studies supporting the generalization: 78%

Number: 8

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: Paul (1977),* Cates (1978), Springfield and Anderson (1979)

Percentage of studies which are inconclusive: 22%

Number: 3

Total number of studies identified: N = 11

Total Number of empirical studies: N = 4 (all categories)*

Total number of non-empirical studies: N = 7 (all categories)

Interpretation of Data-Generalization 1.5 (past success). Generalization 1.5 relates successful linkage enterprise to the extent to which the person or persons responsible for linkage enterprise (e.g., linkage agents) have experienced such success in the past. Similar to other fields, past experience and success is believed to relate to increased skill and know-how in linkage activities.

Results of the literature sources scanned were disappointing. Of the five multi-disciplinary generalizations related to the Linkage Agent, Generalization 1.5 yielded the least information in the literature. Whether this lack of information illustrates relative importance of the factor is not known. In fact, only one source was uncovered which addressed the factor. It is conceivable that additional references may exist. However, the "newness" of the linkage agent role may account for the lack of research attention. Cates (1978) remarks:

> ...the newness of the linking agent as a professional area and the marginality of the role account for the lack of attention to personal concerns of linkers. However, as with project management, increasing maturity and expansion of the field will require increasing attention to these concerns (p. 23).

The utility of past linkage agent success seems reasonable. Experience with a variety of products and programs and in a variety of settings would increase the likelihood that the agent could choose from a number of conceptual and methodological tools. Such a premise was mentioned, but qualified, in the one source uncovered:

> Experience of linking agents. This factor is related to the breadth and depth of the agent's experience in the dissemination/change process and the agent's knowledge of what he/she can do as a result of that experience. Experienced agents are likely to have more cognitive flexibility to deal with a greater number

> and type of client organizations than beginning agents. In addition, experienced agents may be able to anticipate problems more accurately and readily than new agents. In contrast, new agents may be better able to stimulate client enthusiasm and excitement than agents for whom the process is repetitive and 'standard operating procedure' (Cates, 1978, p. 37).

Hence, little knowledge exists with which to evaluate the relatedness of past success and experience to successful linkage enterprise. Figure 1.5 displays the scantiness of the educational research know-how related to this multi-disciplinary factor.

FIGURE 1.5

Generalization 1.5 Successful linkage enterprise is positively related to the extent to which the person or persons responsible for linkage enterprise have experienced such success in the past.

Support: None

Percentage of studies supporting the generalization: 0

Number: 0

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: Cates (1978)

Percentage of studies which are inconclusive: 100%

Number: 1

Total number of studies identified: N = 1

Total number of empirical studies: N = 0 (all categories)*

Total number of non-empirical studies: N = 1 (all categories)

Summary of the Data Related to Part I The Linkage Agent - Generalizations 1.1-1.5. Results of the literature search are displayed below. The number of studies uncovered and the percentages of support, no support or inconclusive calculated on the basis of the research sampled are also shown.

Despite every reasonable effort to locate studies pertinent to the factors expressed in the five multi-disciplinary generalizations, numbers and percentages solely represent calculations of studies discovered in the course of the present investigation. It is believed that these computations represent fairly reliable aspects of the research completed around the themes expressed in the five generalizations. More research would obviously establish how closely the calculations hold true. However, the present effort establishes a research base on which to build further evidence.

The inventory, organization and synthesis of know-how gleaned from the educational research sources revealed little empirical evidence and inadequate research attention to some factors:

1. Generalization 1.1 (behavioral characteristics):

   14 studies, 4 empirical, 100% support.

2. Generalization 1.2 (professional characteristics):

   25 studies, 5 empirical, 64% support, 36% inclusive.

3. Generalization 1.3 (compatibility with target audience):

   15 studies, 4 empirical, 87% support, 13% inconclusive.

4. Generalization 1.4 (time invested):

   11 studies, 4 empirical, 78% support, 22% inconclusive.

5. Generalization 1.5 (past success):

1 study, no empirical studies, 100% inconclusive.

Conditions for Change - Part II, IV and V of the Methodology

Part II, Conditions for Change, of the Wolf-Welsh Linkage Methodology (1979) is summarized by three multi-disciplinary research generalizations:

2.1 Successful linkage enterprise is positively related to a targeted audience's degree of dissatisfaction with practice earmarked for modification;

2.2 Successful linkage enterprise is positively related to a targeted audience's resource potential (i.e., risk money, facilities, flexible staff, etc.) and;

2.3 Successful linkage enterprise is positively related to the extent to which members of a targeted audience have experienced such success in the past.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the second overarching variable, Conditions for Change. In addition, specific educational research outcomes are categorized and discussed according to whether they support, do not support, or are inconclusive with regard to each of the three generalizations related to Conditions for Change, Part II, Steps IV and V of the Methodology.

Thus, information in this section is presented in the following order:

1. perspectives on the research on Conditions for Change;

2. review of specific research studies related to Part II, Conditions for Change, of the Wolf-Welsh Linkage Methodology;
3. interpretation of data - Generalization 2.1 (degree of dissatisfaction);
4. interpretation of data - Generalization 2.2 (resource potential);
5. interpretation of data - Generalization 2.3 (past success);
6. summary of the data related to Part II, Conditions for Change.

Perspectives on the Research on Conditions for Change. A review of various research sources related to Part II, Conditions for Change, revealed a variety of perspectives on the relatedness of this factor to educational dissemination and change. There is an abundance of research information which can be roughly categorized according to the following scheme:

1. empirical studies which investigated "the factors which hindered or helped the use of an innovation" (Paul, 1977, p. 38);
2. case studies of planned change projects which highlighted strategic influences (see Paul, 1977; Far West Laboratory for Educational Research and Development, 1976; Center for New Schools, 1973; Daft, 1974; Sullivan, 1974 for example);
3. theoretical papers which advocated various educational contingencies regarding conditions or readiness for change (see Wolf, 1975; Manning, 1976; Lecht, 1969; Miles, 1964 and Blumenfeld and others, 1978 for example); and
4. few studies which effectively integrated change theory and change practice (see Bennis et al, 1976; Fleming,

1978; Giacquinta, 1973; Baldridge, 1974; and Baldridge and Burnham, 1975 for example).

Various sources were identified that referred to the overarching theoretical factor in a variety of terms and contexts:

1. "leverage points" (Lippitt, Watson and Westley, 1958);
2. "prior states of the system" (Miles, 1964);
3. "conditions for change" (Wolf, 1974);
4. "organizational climate/innovativeness propensity/innovative capacity" (Berman et al, 1975);
5. "organizational capacity" (Walz and Benjamin, 1977).

Despite these theoretical distinctions, most educational sources seemed to agree that certain strategic forces and factors are operative in the target audience which affect the adoption of educational innovations. For example, Greenwood et al (1975) offer the following list of attributes of the institutional setting which influence implementation:

. degree of administrative support and commitment
. past experience with the particular innovation
. high propensity to innovate
. administrative flexibility
. good communications (p. 44).

The authors point out that there are, no doubt, additional attributes of educational settings which play a part in adoption/implementation decisions. However, their research focus precluded the identification of such factors (p. 44).

Numerous sources related such attributes as well as additional ones. Tools offered by Halpin and Croft (1963) - Organizational Climate Descriptive Questionnaire (OCDQ) and Manning (1976) - The "Trouble Shooting"

Checklist for School-Based Settings - illustrate attention to these target audience/school-based factors. Manning (1976) provides 100 descriptive statements which are divided into seven major scales indicative of particular strengths and weaknesses within a school:

Scale 1 - Personality and leadership styles of school-based staff

Scale 2 - Communication patterns and activities

Scale 3 - Central office/school board relationships

Scale 4 - Innovative attitudes and experience

Scale 5 School-community relations and attitudes

Scale 6 - Organizational structure of school and district

Scale 7 - Student attitudes, behavior and demographic characteristics.

Hence, the educational research literature was found to be rich in references to factors subsumed under Conditions for Change.

Efforts to summarize and to make sense out of the array of educational studies which relate to Conditions for Change, Part II, Steps IV and V of the Methodology are framed by Chin's notion (1967) that: "the problem of change is considered to be not necessarily an absence of technical information among members of the client system, but rather the nature of the attitudes, values, human skills and relationships of the people in the system that act to facilitate or resist change" (p. 49). Miles (1964) stated that there are pre-existing conditions in the system which may facilitate or hinder change (p. 41). Organizational, as well as human, factors seem to constitute these facilitating or resisting forces in the target audience system. Paul (1977) induced three major indexes from the empirical literature on this topic:

1) factors internal to the organization (administrative practices, structure, staff attitudes and personality);
2) factors external to the organization (time, funds and community);
3) factors associated with innovations (complexity, compatibility and relative advantage) (p. 47).

Resistance to change has been mentioned by some sources as an important aspect of the target audience and conditions for change (see Griffiths, 1964; Atwood, 1964; Eicholz and Rogers, 1964; Chin, 1967; Lecht, 1969; Katzenbach, 1969; Orlosky and Smith, 1972; Giacquinta, 1973; 1975; Morrish, 1976; Duncan, 1979; Giacquinta and Kazlow, 1979 and Mills, 1979). Intrinsic properties of schools as organizational structures led Griffiths (1964) to comment:

> Indeed, when organizations are viewed over a long period of time, their outstanding characteristic appears to be stability, rather than change. A social organization is the structural mechanism employed by a society to achieve one or more of its commonly accepted goals. Since the goals do not change noticeably and each organization's activities are clearly demarcated, any particular organization comes into existence with a great deal of built-in stability. This stability is so great as to constitute a powerful resistance to change (p. 425).

Miles (1964) reports that there are two distinct views of the American educational system which may account for some examples of resistance to change:

> A frequently encountered view of the American educational system is that it is not a system at all, but a vast, sprawling, complex semi-chaos. Another view sees it as a connected network of subsystems of various size, operating in a more or less coherent way (p. 24).

According to Miles (1967), the so-called locally-controlled school system operates in a complex and often pressurized environment with financial and

legal constraints. Giacquinta (1973) believes that insufficient research attention has been given to resistance aspects of schools and educational change.

Lecht (1969) states that "institutional resistances" are important dimensions which explain the speed with which innovations are adopted in a given field (p. 333). Lecht feels that education has more in common with the building trades and construction industry than to aerospace or electronics industries when viewed from social and economic perspectives:

> Opposition by craft unions, for example, has been a major element in retarding acceptance of a plaster gun which would enable a crew to double the amount of plaster applied in a day. The use of plastics and other synthetics as surface coatings, aluminum in place of other building materials, as well as pre-fabricated housing were all designed to increase efficiency and reduce the cost of building a house. Building trade unions and antiquated building codes requiring special materials constituted powerful institutional resistances to these innovations (p. 333).

Whether educational settings exhibit such rigid, bureaucratic resistances to change is not really known. Characteristics of educational bureaucracies may either resist or facilitate the introduction of innovations according to other sources (see Baldridge, 1974; Mills, 1979).

For example, Rogers (1966) reported that 2.5 percent of the schools are innovators; 13.5 percent are early adopters; 34.0 percent follow somewhat later; 34.0 follow much later; and 16.0 percent are notorious laggards. Some researchers believe that more attention is needed to instances of planned change resistance as well as spontaneous innovation in states/districts/schools in order to better understand operative factors in the target audience.

It seems fairly certain, however, that certain internal and external aspects of the target audience system, both human and institutional, may play a part in the success or failure of linkage enterprise. It remains somewhat unclear as to how completely these factors generalize across diverse educational settings and with different innovations. The variabilities reported in educational settings have confounded the attempts of educational researchers to discern variables which can be manipulated and controlled precisely. A reliable, generalizable and parsimonious "prescription" related to conditions for change does not yet exist. The general outlines of such prescriptive understanding appear in place. However, between this general framework exist a sometimes contradictory group of research principles/findings related to the target audience. Recent work by Paul (1977) has helped to organize and summarize some of the confusion and contradiction within the research literature related to past experience in change programs, availability of time to plan for innovation, availability of funds, organizational climate and orientation of staff.

Review of Specific Research Studies Related To Part II, Conditions for Change. Seeking innovative practices, products or programs and developing the institutional capacity to continually utilize new information are capabilities of educational settings which are seldom encountered (see Berman et al, 1975; Duncan, 1979; Morrish, 1976; and Berman and McLaughlin, 1978 for example). Recent studies related to conditions for change have emphasized the influence of the institutional setting (Berman, et al, 1975) in adapting, rather than adopting educational innovations. Car-

penter-Huffman, Hall and Sumner (1974) reported numerous instances where the institutional setting adapted, modified, or in some cases, simply misused curriculum materials, staff, and other innovative products. Evidence related to the extent of institutional influence and the manner in which individual districts, schools and teachers (e.g., units of change) exert this influence on planned change projects is accumulating in the literature.

Paul (1977) pictures this interaction between planned change or external assistance and the institutional setting as a process of goal compromise that change evaluations need to consider:

> ...that energy introduced into a system, regardless of its source, will be mediated or influenced by system and non-system factors. Over time the mediation will produce an effect that deviates in some degree from the idealized state envisioned at the start of the intervention (p. 54).

The motivations of participants and prevailing conditions within the LEA were two factors identified by Berman and McLaughlin (1975) as more important than "inputs" from outside the LEA (p. x):

> School districts use external inputs, but typically are not influenced by them to change their commitments, motivations, or concern with innovation; unless the institution is receptive to change, it is unlikely to be stimulated by these policy instruments (p. xi).

Based on their findings, external inputs are utilized by schools in ways consistent with local needs (p. 22).

According to one source uncovered, the "input-output" technocratic orientation of much of the American change literature may account for some, if not all, of the missing know-how related to the institutional setting and conditions for change (Huberman, 1973, p. 4). Whether previ-

ous efforts to study aspects of the institutional setting related to innovation and school improvement have missed crucial ingredients and processes because of such bias is not really known. Also, it is perhaps premature to dismiss the data and findings of past evaluations of planned change due to inadequate instrumentation of methodological problems (see Glass, 1976 for example).

Variables related to size, wealth, central office staff, community demand for change, per pupil expenditure, communication facility, tenure of the superintendent and leadership styles have all been mentioned as related to innovativeness in schools and districts. The mutually-adaptive process outlined in the Rand Studies (Berman et al, 1975) led the authors to offer the following list of organizational status measures:

> . wealth
> . level of per pupil expenditure
> . amount of budgetary slack
> . pattern of resource use
> . size
> . age and condition of facilities
> . racial and socioeconomic status composition
> . pupil per teacher ratio
> . staff mobility patterns
> . staff age patterns
> . number of graduates entering college
> . dropout rate
> . innovativeness propensity (an index of (1) the number and rate of widely diffused practices in the district and (2) the nature and number of simultaneous new educational practices in the district)
> . locus of decisionmaking (for budget decisions, curriculum, and allocation of resources and personnel)
> . research and development capacity
> . leadership styles (authoritarian, democratic, etc.)
> (Berman and McLaughlin, 1975, p. 20)

The present investigation discovered a number of studies related to the characteristics of the institutional setting (see 4.0 Target Audience for additional references) and conditions for change. Since 1975, more

and more emphasis has been placed on analyzing and understanding the internal processes of LEAs and individual schools. Mutual cooperation in problem-solving, needs assessment, collaborative planning and evaluation, and internal linkage agent advocacy illustrate aspects of this new focus. It is believed that the growing evidence reported by individual researchers (i.e., Paul, 1977), regional labs (i.e., Far West Laboratory for Educational Research and Development - Transferring Success, 1976), and private research firms (i.e., Rand Corporation, Berman et al, 1975) will, in time, influence federal policy and planned change practice. Further research in the area of conditions for change seems related to questions raised by these researchers.

Interpretation of Data-Generalization 2.1 (Degree of Dissatisfaction). Generalization 2.1 states that successful linkage enterprise is positively related to a targeted audience's degree of dissatisfaction with practice earmarked for modification. As such, the generalization relates the feelings, motivations, frustrations and general organizational climate of members of the target audience to successful linkage enterprise. Obviously, if individual teachers are satisfied with the results of their instructional program, curriculum materials, and student groupings - efforts to change these practices or to introduce some innovative modification will be met with resistance. Assumptions which would seem to underlie Generalization 2.1 are:

1. the feelings of change participants influence the success of change efforts;

2. the feelings of change participants will vary depending on the nature of the proposed change; and,
3. the feelings of change participants towards a particular innovation may vary according to a number of uncontrollable factors (i.e., relative advantage over old practice, amount of perceived risk, status, experience in the system, rewards offered, etc.).

Efforts to change practices or programs where members of the target audience feel satisfied with existing practice are largely unsuccessful according to most sources uncovered. It is believed that feelings of dissatisfaction with practice earmarked for modification suggest aspects of need and motivation in addition to the assumptions above. As a result, sources identified under Generalization 2.1 portray a wide sense of agreement related to the multi-disciplinary generalization.

Some of the studies report that "existing dissemination strategies are less likely to be successful if the innovation requires attitudes that are in conflict with the beliefs of a large portion of the target audience" (McCarthy and Kuh, 1979, p. 1). Inferences are drawn from such statements that support Generalization 2.1. In other cases, studies reported "that the dominant reason (for poor implementation) was lack of interest in change, and a consequent lack of demand for innovative practices (Greenwood et al, 1975, p. 55). Here again, inferences were drawn to support Generalization 2.1. In another example, Skor (1974) reported that mutually-supportive relationships in the educational work unit were significantly related to the implementation of an innovation. It is believed that Generalization 2.1 addresses such aspects of conditions for change. In another case, the Far West Lab for Educational Research and Development

(1976) reported that "successful adoptions cannot occur unless the local school first recognizes that something is lacking and defines its need" (p. 31). Such information was regarded as evidence of support for Generalization 2.1.

Hence, problems of language and technicalities related to precise meanings between the Generalization and information reported in the literature required some degree of interpretation in categorizing the studies. Distinctions as to underlying assumptions and inferences drawn from the studies identified have been reported. It is believed that the studies included represent a fairly accurate picture of what is presently known about Generalization 2.1. However, despite every reasonable effort, there are additional references to the topic which could not be included. The broadness of both the topic and the literature necessitated such restrictions.

FIGURE 2.1

Generalization 2.1 Successful linkage enterprise is positively related to a targeted audience's degree of dissatisfaction with practice earmarked for modification.

Support: Lippitt, Watson and Westley (1958), Miles (1964), Atwood (1964), Eicholz and Rogers (1964), Johnson (1964),* Chin (1967), Albers (1967), Bessent and Moore (1967), Trump (1967), Katzenbach (1969), Lecht (1969), Helsel (1972), Sieber (1972),* Havelock (1973),* Havelock et al (1974), Sikorski and Hutchins (1974), Kester and Howard (1974), Widner (1975), Giacquinta (1975), Berman and McLaughlin (1975),* Greenwood et al (1975),* For West Lab for Educational Research and Development (1976), Morrish (1976), Manning (1976), Emrick, Peterson and Rogers-Agarwala (1977),* Hergert (1978), Duncan (1978), Hurst (1979),* Blumenfeld and others (1979), Hodges, Sheehan and Carter (1979), Miles (1979), McCarthy and Kuh (1979), Meyers (1979), Marsh (1979), Springfield and Anderson (1979).

From Paul (1977): Carr (1974),* Daft (1974),* Skor (1974),* Keenan (1975),* Knopke (1975),* Magee (1975),* Brantley (1975),* Paul (1977)*

Percentage of studies supporting the generalization: 100%

Number: 43

No support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 43

Total number of empirical studies: N = 15 (all categories)*

Total number of non-empirical studies: N = 28 (all categories)

Interpretation of Data - Generalization 2.2 (resource potential). Generalization 2.2 relates successful linkage enterprise to a targeted audience's resource potential (i.e., risk money, facilities, flexible staff, etc.). It is assumed that physical and financial considerations play a role in the adoption/implementation of educational innovations. Time to plan for innovation, incentives, in-service training, and the physical configuration and climate of schools have all been mentioned as important factors in facilitating the introduction of educational innovations.

The relationship of resource potential to successful linkage enterprise was qualified by distinctions made in the literature sources uncovered. Since these distinctions influence what is known about institutional resources and innovative propensity, the following topics represent major aspects related to resource potential as identified in the educational sources consulted:

1. financial considerations;
2. physical and organizational capacities;
3. orientation of staff;
4. time.

Financial Considerations. Literature sources varied in the degree to which they specified or emphasized the importance of a targeted audience's financial resource potential. Some sources generally referred to the need for "adequate funds" (Brickell, 1967), while other sources were more specific in labeling "the most common problem (mentioned by 24 percent of respondents) was a shortage of money" (Johnson, 1964). Fleming (1978) was the most persuasive and specific source identified. In her report, she

criticized the theoretical change literature for underestimating the importance of financial support for change:

> Few change commentators emphasize the need for dollars for change efforts. They rarely explain what 'resources' mean or the financial base of change projects (pp. 19-20).

Independent funding by the Gund Foundation supplied much-needed financial support to reimburse teachers for planning (demanded by the local teachers' union) and money to hire outside consultants and university training courses for program participants. Without such financial support, chances for successful change programs are slim according to Fleming (1978). Other pre-requisites (in order of importance) for urban change programs included:

1. time and resources
2. role clarification
3. bureaucratic supports for change
4. knowledge base
5. staff development or retraining
6. models for planning, development and evaluation (p. 19).

Other aspects of the relationship between financial resources and the innovative capacity of the educational setting are presented below and categorized according to the frequency with which they seemed to occur in the sources uncovered:

1. the size and wealth of the school district is positively related to innovativeness (i.e., see Berman and Pauly (1975), Havelock (1973) and Paisley (1972) for support; see Hughes (1971) and Daft (1974) for lack of support for this financial generalization).

2. the influence of federal funds is positively related to innovativeness (i.e., see Berman and McLaughlin (1975) for lack of support

for this financial generalization). In fact, the authors conclude: "Federal change agent funds did not appear to induce school districts to experiment or take risks with significant innovations. Instead, districts took advantage of the availability of these funds to support temporary add-ons or to finance practices for which prior LEA commitments to solve a local problem existed (p. 24)."

3. school district motivations for seeking federal funds are positively related to innovativeness (i.e., see Paul (1977) and Greenwood et al (1975) for support for this financial generalization). For example, Paul (1977) remarked: "...the availability of funds does not assure that they will be used to provide time for change activities, and even if time is provided there are no assurances that it will be used effectively...Intrinsically motivated districts tended to implement programs well. Extrinsically motivated districts tended to implement programs poorly; they were opportunistic in their requests for federal dollars (p. 50)." Greenwood et al (1975) add: "...where projects were initiated on the basis of some passing fad or funding opportunity rather than because of some long term need, interest or commitment was usually superficial and transitory. New fads, demands and funding possibilities arose to distract management's attention, and the project was left to fend for itself. This was largely the fate, for example, of the career education projects which we observed. Our observation suggest that it is extremely unrealistic to expect a school district to do something wise with its federal money if it is not already committed to something wise when the funds are first received (p. 26)."

4. tax-based financing of public schools presents financial barriers to the introduction of technological innovations or to more complex innovations which would raise taxes (i.e., see Lecht (1969) for support for this financial generalization). Other factors mentioned in the literature and related to this topic included: pattern of resource allocation, budgetary "slack", community support and demand for high quality education, influence of teacher organizations (unions) and the presence or absence of a central office research and development capacity for proposal development and funding (i.e., see Sullivan, 1974).

Consequently, it is believed that the availability of funds for implementing educational innovations is a necessary and important prerequisite in school improvement and change. However, money alone does not guarantee success (see Springfield and Anderson, 1979 also). Factors associated with the prior history of the district in utilizing funds and implementing innovations as well as the motivations and aspirations of the participating individuals (superintendents, school board members, administrators and teachers) may play a more influential role according to many sources identified.

Physical and Organizational Capacities. Some sources noted the influence exerted by certain physical or organizational capacities related to institutional resource potential. Lecht (1969) offered some perspectives on the tradition of American schools related to physical facilities:

> Physical facilities in education have reflected the prevailing concepts of instruction and curriculum, and the stereotypes of the teacher's role which are consistent with these concepts (p. 335).

Various physical and architectural aspects of schools - glass windows, the 25-to-30 pupil classroom "honeycomb" and graded classes do not conform to various requirements of new techologies according to Lecht (p. 335). It seems reasonable that such physical "barriers" would affect the implementation of certain innovations, particularly audio-visual or open classroom-type innovations (see Blumenfeld and others, 1978; Giacquinta, 1973 for example). Katzenbach (1969) reinforces such a notion by pointing out:

> Consider for example all the new technologies introduced in the 1920s - motion pictures, radio, slide projectors and audio recordings. Applications to American education were limited. For example, there were only 600 sound motion picture projectors in the schools of this country as late as 1936 (p. 126).

In a more recent appraisal, Paul (1977) noted that the physical configuration of a school may influence the implementation of innovations (p. 51). Spatial considerations of schools may influence the introduction of team teaching or flexible scheduling according to Paul's sources (see Meyer, 1971; Paul, 1974; Vance, 1974 and Walker, 1975).

Numerous studies have pointed out the importance of good communication channels and interaction of change participants as related to successful adoption/implementation. It is believed that the communication and interaction of change participants may relate to significant physical and organizational aspects of schools and districts. Kemble (1977) advocates federal teacher center legislation as a method of overcoming teacher "isolation" related to the physical organization of schools:

> There is nothing in the structure of schools and their administration that will encourage these conditions to change [isolated working life]...one of their [teacher centers] essential characteristics is teacher sharing, which goes to the heart of the teacher isolation problem (pp. 1-2).

Hence, many educational sources identified physical and organizational factors related to institutional resource potential and conditions for change.

Orientation of Staff. Kemble's (1977) call for teacher centers to facilitate the support and sharing necessary for helping teachers to improve practice illustrates the importance of the orientation of staff as a factor in resource potential. Chesler et al (1967) described organizational and teacher-sharing factors as inter-related:

> ...the objective structure of the school seems to have a different effect on adoption than on innovation. In those schools where the communication structure was more hierarchical, teachers adopted more often than in schools with a diffuse structure. However, in those schools where the communication structure was more spread or diffuse, and where almost everyone was linked to someone, teachers innovated and shared more than in schools with a hierarchical or non-diffuse structure (p. 73).

Skor (1974) discovered that supportive relationships, group decision-making processes and goal-setting behaviors were all associated with successful implementations. Paul (1977) distinguished the orientation of staff as related to two organizational dimensions: a systemwide organizational orientation versus a self-centered, classroom orientation" (p. 57). Data reported by Paul indicates that the systemwide orientation of staff is positively related to educational innovation. Information cited in other studies related to leadership styles, central office characteristics, and community support for schools support Paul's data on the orientation of staff.

Hence, many studies were identified which reported data related to school staff and the orientation of staff as an important aspect of insti-

tutional resource potential and conditions for change.

Time. Case studies of planned change projects were much more likely to emphasize the importance of time (time to plan, teacher release time, in-service training time, and September-to-June time schedules) than other studies. Fleming's report (1978), cited earlier, labeled time-to-plan as one of the most important prerequisites for change programs. Many sources commented on the availability of time when teachers already felt overburdened with teaching and non-teaching tasks. Resistance to change is seen as related to time aspects of the schools and districts where many innovations require learning new skills or attending after-school or summer workshops. Paul (1977) stated that the availability of time to plan and implement school improvements influenced the change process (pp. 48-49). Hence, some sources indicated that time and time for teachers to plan were sometimes chronological aspects of institutional resource potential.

Data obtained from the educational studies generally supported the importance of resource potential to successful linkage enterprise as stated in Generalization 2.2. However, it was noted that four major topics - financial considerations, physical and organizational capacities, orientation of staff, and time - were categorical distinctions or subsets of institutional resource potential as identified in the educational research literature. As a result, analyses of the data obtained was organized around these subtopics of the major factor - resource potential. Additional issues and questions regarding financial resources were presented in a sequence designed to show their relative weight in the sources uncovered.

It is believed that resource potential, or more precisely, resources for innovation and change, have received significant research attention. Despite this attention, few studies were located that integrated the findings of previous planned change efforts or the relationships of institutional resource potential to successful adoptions/implementations. What specific factors that account for such a lack of integration between theory and practice are not known.

Studies displayed in Figure 2.2 display support for the multi-disciplinary factor. Empirical studies from Paul's report (1977) are grouped and labeled according to subtopics. Studies displayed as Inconclusive to the influence of financial funds derive from Paul (1977) and the Rand studies (Berman et al, 1975). These reports raise valid questions about resource potential and are judged to be largely inconclusive in light of the assumptions contained in Generalization 2.2.

FIGURE 2.2

Note: Some studies are displayed in more than one category or in two places within the same category. The total number of studies (N=39) represents only the number of sources identified and not the number of times listed.

Generalization 2.2 Successful linkage enterprise is positively related to a targeted audience's resource potential (i.e., risk money, facilities, flexible staff, etc.).

Support: Johnson (1964),* Mort (1964), Brickell (1967), Havelock and Benne (1967), Paisley (1972), Havelock (1973a), Cutter (1974), Berman and McLaughlin (1975),* IPOD (1976),* FWLFER&D (1976), Manning (1976), Morrish (1976), Guttinger and Hines (1977), Walz and Benjamin (1977), Paul (1977),* Fleming (1978), Rogers and Rogers-Agarwala (1979),* Springfield and Anderson (1979), Mills (1979).
From Paul (1977) ERIC ED 141 898 Time to Plan:
Banfield (1975),* Bowens (1975),* Robeson (197),* Vold (1975)*
Also: Fleming (1978), Skor (1974)*
From Paul (1977) Physical Facilities:
Meyer (1971),* Vance (1974),* Walker (1974)*
Also: Lecht (1969), Katzenbach (1969), Kemble (1977), Chester et al (1967)*

Pecentage of studies supporting the generalization: 79%

Number: 31

No Support: None

Inconclusive: On Funds - Berman et al (1975),* Hughes (1971)*
From Paul (1977) ERIC ED 141 898: Jarman (1974),* Melby (1975),* Richardson (1974),* Sullivan (1974),* Vance (1974),* Daft (1974)*

Percentage of studies which are inconclusive: 21%

Number: 8

Total number of studies identified: N = 39
Total number of empirical studies: N = 21 (all categories)*
Total number of non-empirical studies: 18 (all categories)

Interpretation of Data - Generalization 2.3 (past success). Generalization 2.3 relates successful linkage enterprise to the extent to which members of the target audience have experienced such success in the past. Experience in past change programs and a prior history of innovative activity are thought to be positively related to linkage enterprise.

Data derived from the Rand studies (Berman et al, 1975) would seem to suggest that past success in successful adoptions/implementations is related to success in future efforts. Mort (1964) reported that "communities vary in the degree to which they take on new practices. Slow adoption of one innovation reveals a similar pattern with others. The reverse is true also" (p. 325).

Havelock (1973a) advised change agents to:

> ...study the past history of his prospective client in dealing with similar change efforts. If the system has persistently responded to change efforts with indifference or rejection, it is probably a signal that the system is a poor bet for future efforts (p. 59).

Paul (1977) reported that experience in past change programs and expectations for future programs influences the change process (p. 58). It seems reasonable that information reported under Generalizations 2.1 and 2.2 would suggest general support for the relationship of past experience to successful linkage enterprise. However, it was noted that few studies reported this connection.

It is believed that know-how related to the individual stages of innovation-adoption (see Magee, 1975; Hurst, 1979; Wolf and Fiorino, 1972 for example), factors associated with organizational climate (see studies under Generalization 2.2), and factors related to individual innovative-

ness (see Corwin, 1975 and Louis et al, 1979 for example) all provide important perspectives on Generalization 2.3.

Despite such relationships, studies displayed in Figure 2.3 were selected on the basis of how specifically they reported information related to the factor. The number of studies which imply support for Generalization 2.3 is large. No studies were located which reported information regarding change participants who experienced frustration, negative attitudes, or disappointment related to their participation in planned change programs (see Giacquinta, 1973; Gross et al, 1971). Such experiences could conceivably create increased resistance to change and lead to unfavorable attitudes towards future innovations and change. Whether such cases are reported in the literature is not known. It seems reasonable, however, that the assumptions contained in Generalization 2.3 might vary according to the individual, the particular innovation, implementation problem, changed roles or status, and the rewards and reinforcements offered.

Hence, studies displayed reveal general support for the factor of past success in change programs. However, it is believed that research attention to this factor is not sufficiently present in the literature; and further, that instances of resistance to change related to past experience may not have been reported in sufficient scope and detail in the sources consulted.

FIGURE 2.3

Generalization 2.3 Successful linkage enterprise is positively related to the extent to which members of a targeted audience have experienced such success in the past.

Support: Mort (1964), Griffiths (1964), Eicholz and Rogers (1964), Bessent and Moore (1967), Havelock (1973a), Berman et al (1975),* Morrish (1976), Walz and Benjamin (1977), Paul (1977),* Blumenfeld and others (1978) From Paul (1977) ERIC ED 141 898: Whiting (1972),* Magee (1974),* Skor (1974),* Daft (1974),* Kane (1976)*

Percentage of studies supporting the generalization: 100%

Number: 15

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 15
Total number of empirical studies: N = 7 (all categories)*
Total number of non-empirical studies: N = 8 (all categories)

Summary of The Data Related to Part II, Conditions For Change, Generalizations 2.1 - 2.3. Results of the literature search are displayed below. The number of studies uncovered and the percentages of support, no support or inconclusive calculated on the basis of the research sampled are also shown.

Despite every reasonable effort to locate studies pertinent to the three multi-disciplinary generalizations related to Conditions for Change, calculations represent only the research sampled. Much has been said and written about Conditions for Change. To identify every study which reported information on the topics proved impossible. However, data obtained represent reliable aspects of what is presently known.

The present investigation uncovered the following results:

1. Generalization 2.1 (degree of dissatisfaction):
   44 studies, 15 empirical, 100% support
2. Generalization 2.2 (resource potential):
   39 studies, 21 empirical, 79% support, 21% inconclusive (on funds)
3. Generalization 2.3 (past success):
   15 studies, 7 empirical, 100% support.

3.0 The Innovation Part III, IV and V of the Methodology

Part III, IV, and V, the Innovation, of the Wolf-Welsh Linkage Methodology (1979) is summarized by seven multi-disciplinary research generalizations:

3.1 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and identi-

fied needs of a targeted audience;

3.2 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and the generally accepted professional practice of persons who comprise a targeted audience;

3.3 Successful linkage enterprise is positively related to the extent to which selected innovations can be physically manipulated (i.e., sub-divided, modified, etc.);

3.4 Successful linkage enterprise is positively related to the extent to which selected innovations can be pilot tested;

3.5 Successful linkage enterprise is inversely related to the complexity of selected innovations;

3.6 Successful linkage enterprise is inversely related to the number of problems members of a targeted audience are able to raise about selected innovations;

3.7 Successful linkage enterprise is positively related to how well available information depicts strengths and limitations of selected innovations.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the third overarching variable, the Innovation. And second, specific educational research outcomes are categorized and discussed according to whether they support, do not support or are inconclusive with regard to each of the seven generalizations related to the Innovation, Parts III, IV and V of the Methodology.

Thus, information in this section is presented in the following order:

1. perspectives on the research on the Innovation;
2. review of specific research stdies related to Part III, IV and V, the Innovation, of the Wolf-Welsh Linkage Methodology;
3. interpretation of data - Generalization 3.1 (compatibility with needs);
4. interpretation of data - Generalization 3.2 (compatibility with practice);
5. interpretation of data - Generalization 3.3 (divisibility);
6. interpretation of data - Generalization 3.4 (observability-pilot test);
7. interpretation of data - Generalization 3.5 (complexity);
8. interpretation of data - Generalization 3.6 (problems raised by target audience);
9. interpretation of data - Generalization 3.7 (information-strengths/weaknesses);
10. summary of the data related to Part III, the Innovation.

A review of various educational research sources related to Part III, the Innovation, revealed a variety of perspectives on the relatedness of this factor to educational dissemination and change. There is a quantity of educational research which can be roughly outlined according to the following scheme:

1. Research reported from other disciplines (i.e., rural sociology, medicine, anthropology, and marketing) which has been utilized by educational researchers in explaining the speed and extent to which innovations are adopted in educational settings (see Rogers and Shoemaker, 1971);

2. Studies of planned educational change which stress the importance of the attributes of innovations and describe how these attributes (especially complexity, compatibility, and observability) are believed to influence decisions to adopt or reject an educational innovation (see Wolf and Fiorino, 1972; Matula, 1972; Hahn, 1974; Holloway, 1975 and Allan, 1977a for example); and,

3. Efforts which attempt to identify empirical dimensions related to these attributes of innovations in educational settings that sometimes report conflicting or contradictory evidence. Such studies raise questions about the generalizability of these multi-disciplinary attributes to educational dissemination tasks (see Allan, 1977a; Paul, 1977; Carlson, 1965a; House and others, 1972; Giacquinta, 1973; Gross et al, 1971; and Hahn, 1974 for example).

The characteristics of innovations have traditionally received a great deal of research attention in the educational literature. Most sources identified stressed the importance of specific attributes of innovations as primary variables in explaining both the speed and extent to which innovations diffuse through educational settings and practice. The variety of theoretical models of change reported in the literature (see Havelock in Eidell and Kitchell, 1968; Havelock, 1969; Piele, 1975; Crandall, 1977 and Butler and Paisley, 1978 for example) all reported on the characteristics of the innovation as a major aspect in explaining successful adoption and linkage.

The five attributes of an innovation, described and explained by

Rogers and Shoemaker (1971), have been widely quoted and utilized by educational researchers. Rogers and Shoemaker point out, however, that these attributes represent "perceptions" of the receivers; hence, innovative characteristics may be perceived differently by different receivers (p. 22):

> The several characteristics of innovations, as sensed by the receivers, contribute to their speed of adoption.
>
> 1. Relative advantage is the degree to which an innovation is perceived as better than the idea it supercedes. The degree of relative advantage may be measured in economic terms, but often social prestige factors, convenience, and satisfaction are also important components... (Generalizaion 3.6).
> 2. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of the receivers. An idea that is not compatible with the prevalent values and norms of the social system will not be adopted as rapidly as an innovation that is compatible... (Generalizations 3.1 and 3.2).
> 3. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Some innovations are readily understood by most members of a social system; others are not and will be adopted more slowly... In general, those new ideas requiring little additional learning investment on the part of the receiver will be adopted more rapidly than innovations requiring the adopter to develop new skills and understandings... (Generalization 3.5).

4. Trialability is the degree to which an innovation may be experimented with on a limited basis. New ideas which can be tried on the installment plan will generally be adopted more quickly than innovations which are not divisible... (Generalization 3.3).
5. Observability is the degree to which the results of an innovation are visible to others. The easier it is for an individual to see the results of an innovation, the more likely he is to adopt... (Generalization 3.4). (Rogers and Shoemaker, 1971, pp. 22-23).

Thus, six of the seven multi-disciplinary generalizations, related to Part III, the Innovation, of the Wolf-Welsh Linkage Methodology (1979) are derived from the multi-disciplinary research reported in Rogers and Shoemaker (1971).

For years, various researchers have questioned the generalizability of such research to educational settings (see Brickell, 1964; Guba, 1965; Havelock, 1969; Wolf and Fiorino, 1972; Heathers, 1974; Wolf, 1975; Allan, 1977a/1977b for example). Perspectives identified in these studies relate to:

- the uniqueness of educational change and practice (Brickell, 1964; Guba, 1965. See Eicholz and Rogers, 1964; Miles, 1964 and 1967; and Lippitt, 1967 for elaboration on this point);
- market versus non-market incentives related to the attributes of innovations and adoption (see Pincus, 1974 for special attention to this factor);
- the nature of innovation/adoption stages and the behavior of educational practitioners in evaluating the attributes of innovations

(Guba, 1964; Wolf and Fiorino, 1972; Havelock, 1969; Gulesian, 1970);

- the suspicious quality and lack of integration in the educational diffusion research literature (Heathers, 1974; Allan, 1977b. Also see Giacquinta, 1973 and Short, 1973 for additional information related to this point).

Despite these distinctions, most models of educational change continue to employ the five major attributes of innovation as reported in Rogers and Shoemaker (1971).

In the Rand studies (Berman et al, 1975), comparisons were made between research conducted on "technology" and research conducted on educational innovations. Differences were noted that caused Berman and McLaughlin (1974) to remark:

> These dissimilarities raise questions about the relevance of the diffusion literature (and its assumptions) for innovation in education. A technology or product can be thought of as possessing the following general attributes:
> . Clarity and specificity of goals
> . Specificity of treatment
> . A clear relation between treatment and outcome
> . Passive user involvement
> . A high level of certainty of outcome
> . A unitary adopter
> Because of these characteristics, a technology or product is usually invariate in its implementation and in its outcome from one context to another. In contrast, innovative strategies in education (unlike technologies - a new pill, a new airplane or a new hybrid seed corn) tend not to be invariate ... In fact, in comparison with 'technologies,' educational innovations may be said to possess the following general attributes:
> . treatments are incompletely specified
> . outcomes are uncertain
> . active user involvement is required
> . the adopter is not unitary but a policy system or policy units
> . the relationship of project treatment to overall institutional goals is unclear or unspecified (p. 9).

Implementation problems, partial adoptions, re-inventions, modifications, and discontinuance of the innovative practice after federal funds are withdrawn have all been mentioned in the educational literature. Innovations are seldom adopted as planned and adaptation occurs more frequently than complete adoption (see Berman et al, 1975; Carpenter-Huffman, Hall and Sumner, 1975; Larsen and Rogers-Agarwala, 1979 for example). Such phenomenon are common in the educational sources identified and have led to a number of related theories regarding the relationship between the perceived attributes of innovations and the educational practice setting.

Chin (1967) has proposed a useful scheme for assessing the kinds of changes implied by the adoption of a particular innovation:

a) substitution
b) alteration
c) perturbations and variations
d) restructuring
e) value orientation change (pp. 334-335)

In a similar way, Pincus (1974) offered a typology of the different ways that educational innovations can affect the operation of schools:

- increasing the level of resource use only ('more of the same' - e.g., a smaller class size);
- changing the resource mix (a higher proportion of teacher aides, relative increase in capital equipment);
- changing instructional processes or methods without significantly changing resource level or mix (new math, new reading curriculum);
- affecting administrative management, without significant effects on organizational power structures (computerizing data management, new accounting systems);
- changing either the organizational structure of the schools or the relation to external authority (community control, open schools, voucher systems) (p. 117).

Utilizing Pincus' scheme, Berman and McLaughlin (1974) suggest that incorporation of an innovation (complete implementation) be measured "by the

degree to which it involves (1) incremental changes to established routines, (2) expansions of the existing repertoire by new elements, or (3) replacement of previous institutional patterns of behavior (p. 22)." Hence, these studies (Chin, 1967; Pincus, 1974; and Berman, et al, 1975) suggest that "the scope of change implied by the project relative to its setting" (Berman and McLaughlin, 1975), requires closer scrutiny and increased attention by educational researchers.

Further evidence related to the variabilities reported in educational settings supports this theoretical orientation. Heathers (1974) has commented on the complex nature of the school system in light of the interaction of its various systems and subparts:

> The uniqueness of each school system compounds the difficulties in planning and conducting change programs. In curriculum, learning materials, plant and equipment, student body, and staff a given school system is not quite like any other. For these reasons, any innovation needs to be adapted to the characteristics of schools where it is employed. Since the components of any system interact, changing any part of the system imposes strains on the other parts and tends to change them too. Unfortunately, many school staffs do not appreciate this interrelatedness, and they tack the innovation onto the existing school program with the aim of creating as little dislocation of existing practices as possible (p. 47).

References to the impact of innovation adoption on the social system operation of schools can also be found in Lippitt, Watson and Westley (1958), Miles (1964) and Havelock (1969; 1973a).

In summary, while many educational sources reported on the function of specific attributes of innovations; other sources reported information related to the impact of innovations on the educational practice setting. Changes implied by the adoption of a particular innovation rather than the

specfic characteristics of the program, practice, or product to be adopted were highlighted in these studies. Whether the determinants of adoption and educational change are intrinsic to the particular innovation, or extrinsic to the specific school or district (adopting unit), or interrelated between intrinsic and extrinsic factors (and thus, highly variable and difficult to generalize) is not made clear in the educational literature.

A Review of Specific Research Studies Related To Part III, The Innovation, of the Wolf-Welsh Linkage Methodology (1979). Certain studies were identified that illustrated problems associated with the attributes of innovations, adoption and implementation, and consequently, school improvement. Two major generalizations were gleaned from information reported in these studies:

1. Schools are highly complex, self-perpetuating, non-market social environments that utilize external inputs (i.e., state and federal policy guidelines, community pressure, planned change or external assistance and improvement efforts) in unique ways. Stability, tradition and incremental changes in practice and operations characterize the response of schools to these external pressures (see Pincus, 1975; Brickell, 1964; Evans, 1969; and Paul, 1977).
2. Although schools have adopted many innovations since 1958, most of these innovations represent "substitutions or alterations" (Chin, 1967) of existing practice. Hence, innovations with the highest system congruence have diffused and been adopted the

most rapidly. However, these innovations have affected the least change in "basic organizational structure or relation to external authority" (Pincus, 1974).

Schools are, in a sense, a "public utility" (Pincus, 1974, p. 113) since they exercise "monopoly control" (Carpenter-Huffman, Hall and Sumner, 1974) over a "captive clientele" (Pincus, 1974, p. 115). Incentives for improved instruction based on student learning or clearly defined goals and methods for achieving those goals are not present in educational settings. As a result, the objective structure and processes of schools are characterized by a unique set of priorities and constraints:

> From the viewpoint of a market economy, it might be argued that many of the innovations adopted by the schools are not innovations at all, but only fads, since there is little or no serious attempt to validate them in terms of productivity or performance criteria, nor is there any market-like mechanism which automatically separates wheat from chaff (Pincus, 1974, p. 119).

Carpenter-Huffman, Hall and Sumner (1974) discovered the same qualities in their attempt to introduce performance contracting to schools:

> ...schools will be prone to reject innovations that might change current roles, functions, and positions of teachers and administrators, or otherwise conflict with internal values, and will be tempted to adopt innovations that look showy even though the changes may have no greater or even less advantages than current practice provides (p. 9).

Brickell (1964) analyzed the extent of innovation adoption in the New York State schools and found that the great bulk of schools as structured institutions had remained stable despite an increased rate of instructional innovation (p. 495). In addition, Brickell uncovered that:

> Most changes involved an alteration in subject content (ordinarily different information and more of it), in

> instructional material (usually a new textbook), or in the grouping of pupils (most commonly class size reduced or varied). Few programs embodied changes in the kind of people employed, on the way they were organized to work with students, in the nature of instructional materials they used, or in the times and places at which they taught (pp. 495-496).

Schools wish to be viewed as "up-to-date, efficient, professional, and responsive" according to Pincus (1974, p. 122). However, three major factors account for any willingness to adopt particular innovations:

> 1. Bureaucratic Safety - When the innovation is perceived as favorable with respect to the current status and organization of the bureaucracy (because in a self-perpetuating non-market system, these bureaucratic values become socialized and tend to dominate other criteria; or in other words, the bureaucratic costs are the real costs of the system).
> 2. Response to External Pressure - When external pressures for innovation are perceived as irresistible (because school systems cannot be entirely unresponsive to external pressures and financial constraints).
> 3. Approval of Peer Elites - When key figures in the bureaucracy and their colleagues in other bureaucracies can agree about the acceptability of the innovation (because in the absence of clearly defined output criteria, consensus among the elite is often the primary decision-making criterion) (p. 120).

According to Pincus (1974), these three factors are useful frameworks from which to assess both the adoption and the scope of change implied by the adoption. New math, the PSSC curriculum, and language labs tend to spread more quickly, while innovations like ungraded classes and open classrooms diffuse much more slowly. Innovations that imply major structural or organizational/resource redistribution (i.e, voucher systems, abolition of tenure, or community control) hardly spread at all (pp. 116-117).

Differences related to the attributes and consequences of innovations, methods and channels of communication utilized to inform selected target audiences of these innovations, the bureaucratic and social system

influences that affect decisions to adopt, and subsequent implementation problems and processes have been well-documented in the educational sources discussed. Recent research has focused on the interactions and relationships between (1) the attributes of innovations, (2) linkage/linkage agent modus operandi, and (3) the target setting. Some studies emphasized the user and the process of adoption, but paid little attention to the characteristics of the innovation. When characteristics of innovation were studied or discussed, most educational researchers utilized the attributes described by Rogers and Shoemaker (1971) or derivations from the original five.

Recent work at the University of Massachusetts at Amherst has questioned the ubiquity of such multi-disciplinary attributes of innovation to educational settings and linkage tasks. For example, Allan (1977a) attempted to test Rogers and Shoemaker's attributes in an educational context. The results of his investigation revealed that:

> 1. Four of the five attributes are not applicable to educational innovations as presented. The only attribute which applies to education as it does to other disciplines is complexity.
> 2. Several sub-attributes were found to be important in the adoption of educational innovations.
> 3. Several sub-attributes appeared to have the opposite effect on educational innovations as they did on innovations adopted in other disciplines.
> 4. The sub-attributes which were found to be important in the adoption of educational innovations should serve as a base for the development of a new set of attributes based on educational research (p. vi).

Outcomes reported by Hahn (1974) raise additional questions about the utility of previous multi-disciplinary data:

> The factor analysis indicated that perceptions empirically did not occur together in the categories of relative advantage, compatibility, observability,

> trialability and complexity. Rather perceptions fell into four distinct perceptions of observability of valued outcomes, feasibility, similarity, and a slightly changed category of complexity (p. 12).

The studies of Allan (1977a) and Hahn (1974) reported empirical distinctions or sub-attributes related to the major attributes of innovations described by Rogers and Shoemaker (1971). On the other hand, Paul (1977) identified "firm" generalizations related to three major attributes (relative advantage, compatibility and complexity) and supported these generalizations with thirteen empirical studies. Carpenter-Huffman et al (1974) encountered difficulties in adapting proposed changes to existing school operations (relative advantage, trialability, and observability) and discovered specific problems related to the relative advantage of the proposed change:

> ...experience has made many educators suspicious of any new panacea. It is not surprising that they doubt the relative advantage of proposed changes... The complexity of the educational process and the goals of education also make it difficult to assess the relative advantage of a proposed innovation... As a result, educators have a great freedom in interpreting relative advantage, or from another point of view, much difficulty in proving it. The problem is made more severe by the relatively undeveloped state of educational measurement (p. 12).

Hence, despite much empirical work and quantities of theoretical and case study reports, careful review identified two major flaws in the research scanned on the characteristics of the innovation:

1. <u>widespread utilization of research outcomes reported from other disciplines (i.e., rural sociology, medicine, agriculture) despite substantial theoretical opposition and some empirical evidence which question the ubiquity of such research to educa-</u>

tional linkage enterprise;

2. sometimes conflicting empirical evidence in the experimental studies identified...such differences can only be resolved by additional, more rigorous research on the characteristics of innovations, and specifically, to test which (if any) of the attributes described by Rogers and Shoemaker (1971) generalize to educational contexts predictably.

Interpretation of Data - Generalization 3.1 (compatibility with needs). Generalization 3.1 related successful linkage enterprise to the degree of compatibility between selected innovations and the identified needs of the target audience. Innovations that meet needs will be adopted more rapidly and completely than innovations that do not. Priorities and needs change rapidly; however, recognition of these changes and "new" needs follows much more slowly. For example, urban school curriculum has slowly changed in response to changes in population, community and student pressure, teacher dissatisfaction with existing texts and material, and the availability of training for use of new multicultural curriculum. Keeping pace with the proliferation of educational needs and services that schools are expected to provide is a continuing challenge for both educators and researchers alike.

All of the sources identified in the scan of the educational research literature advocated that developers and linkage agents "match" or "fit" innovations to the needs of the school or district. Without high degrees of compatibility between the innovation and the identified needs of the target audience, chances for adoption and implementation are slim. No

studies were uncovered that did not stress the importance of innovation congruence with needs. In fact, Generalization 3.1 seemed axiomatic in most major models of educational change, case studies and field reports, and the several empirical studies that were identified.

Paul (1977) isolated a "moderately firm" generalization related to school needs and the change program:

> Recognition that solvable problems exist is a first step toward successful change and school improvement. The solution of innovation should address the needs that have been recognized, and conversely, if teachers do not perceive the need for a particular innovation then its implementation is doubtful (p. 37).

The increasing number and sophistication of tools designed to identify and assess needs (i.e., the Hutchinson Needs Analysis Methodology) underline the importance of needs acquisition. Federal and state funding for innovative projects and planned change programs exhibit attention to these matters also. It was noted, however, that few studies treated this needs acquisition phase of a change program with much detail or precision. Most of the studies related correlations between particular innovations and needs, but only a few touched on the complexities involved. Matula (1972), for example, explained some of his research outcomes in terms of possible differences between faculties and their responses to three different social studies programs:

> These differences in willingness between faculties may reflect differences in general attitude toward innovation, differences in the nature of the perceived needs of students, or differences in the perceived compatibility of the innovation with the current program (p. 7).

Paul (1977) pointed out that "the lack of agreement over the attributes of a specific innovation can result in misunderstandings, frustration, and conflict" (p. 51). It is believed that the "needs" of a target audience are extremely pejorative and in some cases, idiosyncratic. The "fuzziness" of the terminology in most of the educational studies related to needs of the target audience raises questions as to how linkage agents can meaningfully "match" innovations with these needs. Although some sources provided detailed and fairly reliable methods or identified tools for needs assessment, most of the sources did not. Such omissions or distinctions related to the needs of the target audience and inferences drawn from Matula (1972) and Paul (1977) point to problems which need to be addressed.

The degree of compatibility between selected innovations and identified needs of the target audience is well supported in the educational research literature. However, many sources seemed to view schools as having the capacity to systematically identify needs. Consequently, linkage agents work from these needs to identify programs, practices, or products which would meet or fulfill these needs. Havelock (1973) and Havelock and Lingwood (1973) have pointed out that to insure true linkage, linking agents need to assist schools in identifying needs and in utilizing information in a continuing, reciprocal and collaborative relationship. Hence, these sources emphasize the assistance and antecedent relationship of linking agents and target audiences to insure that needs as well as solutions are well planned.

Whether the presence of established roles and functions (i.e., a research department or director of special projects), adjunct committees or

groups (i.e., a task force committee to assess the need for a new high school, neighborhood or special interest groups), or the utilization of needs assessment tools prior to innovation planning and adoption influence the innovativeness of schools and school districts, is not known. Such organizational capacities and community awareness and interest would seem related to successful linkage enterprise.

FIGURE 3.1

Generalization 3.1 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and identified needs of a target audience.

Support: Havelock and Benne (1967), Chin 1967), Havelock 1969), Katzenbach (1969), Sieber (1972;* 1973), Watson (1972), Matula (1972),* Helsel (1972), Huberman (1973), Center for New Schools (1973), Havelock and Lingwood (1973),* Cutter (1974), Pincus (1974), Heathers (1974), Havelock et al (1974), Sikorski and Hutchins (1974), Kester and Howard (1974), Holloway (1974),* Widmer (1975), IPOD (1976),* Parish (1976), Allan (1977b), Emrick et al (1977),* Paul (1977*

Percentage of studies supporting the generalization: 100%

Number: 25

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 25

Total number of empirical studies: N = 7 (all categories)*

Total number of non-empirical studies: N = 18 (all categories)

Interpretation of Data - Generalization 3.2 (Compatibility with Practice). Generalization 3.2 relates successful linkage enterprise to the degree of compatibility between selected innovations and the generally accepted professional practice of persons who comprise a target audience. Innovations that conflict or require major changes in the roles or *modus operandi* of persons who comprise the target audience will spread more slowly than innovations that do not. Change involves risk and there are few, if any, professional or financial incentives for adopting new educational practices, programs or products. In fact, certain institutional, social and professional norms and practices can actually discourage or inhibit such activity. For example, the following organizational properties and procedures common to most schools systems, illustrate this phenomenon:

1. Accountability and tenure. Numerous sources have pointed out the vagueness associated with educational enterprise, especially in terms of student achievement and "outputs" measured by criteria applicable to teacher performance (see Pincus, 1974; and Heathers, 1974 for example). In the absence of objective measurement, beginning teachers fulfill a three year "probation" period leading to tenure (some states have instituted accountability through examinations also). Non-tenured teachers are especially vulnerable to the evaluations of principals, curriculum directors, and superintendents. Advocating change, experimenting with innovative methods in classroom management or materials, or challenging the merits of existing practice are behaviors and activities likely to "rock the boat." Many non-

tenured teachers appreciate the dynamics involved in tenure acquisition (professional security) and take relatively few chances with changing existing practice. Hence, most teachers attain job security through the maintenance of existing institutional norms, values and practices. Few discernible incentives or rewards exist for changing practice.

2. Financial and Social Considerations. Financial rewards and incremental raises for teachers accrue through longevity rather than from other measures of performance. Unless federal or state funds are allocated to reimburse teachers for planning and training to change practice (see Fleming, 1978; Berman et al, 1975), teachers may view the time and risks involved in innovation and implementation as requiring unnecessary extra time and effort. Since most teachers are already overburdened with a variety of teaching and non-teaching tasks, it is not unreasonable to believe that innovations requiring minimal changes in existing practice or the least amounts of teacher planning and retraining would be viewed more positively. Most case studies support this view (see Holloway, 1975 for example).

3. Leadership for Change. Brickell (1964) has pointed out that "teachers are not change agents for innovations of major scope. Even when free to guide their own activities, teachers seldom suggest distinctly new types of working patterns for themselves. Customarily, teachers make only three types of changes: (1) change in classroom practice, (2) relocation of existing curriculum content, or (3) the introduction of single special courses

> at the high school level (pp. 503-504)." Rearrangements of institutional patterns or new types of instructional programs depend almost exclusively upon administrative initiative according to Brickell (1964, p. 503). Hence, administrators, directors, curriculum heads and superintendents are viewed by many sources as major stimulators or inhibitors of change. Leadership that encourages change and facilitates and creates a climate for adoption would seem to be positively related to successful linkage enterprise.

Taken together, these three overarching factors - accountability and tenure, financial and social considerations, and leadership for change - provide a succinct view of perspectives identified in the research sources related to Generalization 3.2.

All of the educational research sources consulted supported Generalization 3.2. In general, compatibility with needs and compatibility with practice were related simultaneously. Both Miles (1964) and Rogers and Shoemaker (1971) reported that "compatibility of an innovation with a preceding idea can either speed up or retard its rate of adoption. Old ideas are the main tools with which new ideas are assessed" (Rogers and Shoemaker, p. 147). Schemes reported previously (see Chin, 1967 and Pincus, 1974) were well-supported in the educational sources. That is, there are distinct relationships between the kind or scope of change implied by the innovation and the compatibility of the innovation with existing practice. Walz and Benjamin (1977) relate that:

> If an innovation requires drastic changes in roles and routines, it may cause a great deal of resistance. People develop habits of operating and become secure

> in predictable routines. They also perform certain functions that are usually well-defined. The less an innovation conflicts with existing ways of doing things and present role expectations, the more likely people will be to try it (p. 52).

Havelock (1973a) has pointed out that prior innovative activity in the school or district increases future prospects for linkage agents to assist these schools in adopting additional new practices.

Paul (1977), however, crystallized a thorny problem reported in a variety of educational sources. The greater the degree of compatibility between the innovation and the existing practices of the school, the less likely the innovation is to affect change. Thus, the adoption of highly compatible innovations, although more likely, is less consequential (p. 52). Paul based his assessment on a quantity of empirical work and the notation by Rogers and Shoemaker (1971) that:

> Obviously, however, if a new idea were completely congruent with existing practice, there would be no innovation, at least in the mind of the receiver. Put in other words, the more compatible an innovation is, the less of a change it represents (p. 147).

The views of these researchers, while pointing out the consequences of compatibility aspects of innovations, seem most representative about what is known about Generalization 3.2. Huberman (1973) summarized these aspects by theorizing that:

> The critical factor seems to be not the nature of the innovation nor its potential for improving learning, but rather the adopter's concept of the changes he personally will be required to make. Innovations in fact never seem to be installed for their intrinsic value. Whenever an important innovation is proposed teachers and administrators are being asked to interact differently with each other and with the students; hence, the immediate emphasis must be on changing attitudes and only later on changing practices and procedures (p. 3).

FIGURE 3.2

Generalization 3.2 Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and the generally accepted professional practice of persons who comprise a targeted audience.

Support: Trump (1967), Chin and Benne (1969), Hoke (1970), Matula (1972),* Watson (1972), Wolf and Fiorino (1972),* Helsel (1972), Huberman (1973), Center for New Schools (1973), Chin (1974),* Pincus (1974), Watson (1974), Sikorski and Hutchins (1974), Kester and Howard (1974), Holloway (1974),* Piele (1975), Widmer (1975), Berman et al (1975),* Parish (1976), Bailey (1976), Walz and Benjamin (1977), Emrick et al (1977),* Paul (1977),* McCarthy and Kuh (1979).

Percentage of studies supporting the generalization: 100%

Number: 24

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 24

Total number of empirical studies: N = 7 (all categories)*

Total number of non-empirical studies: N = 17 (all categories)

Interpretation of Data - Generalization 3.3 (Divisibility). Generalization 3.3 relates successful linkage enterprise to the extent to which selected innovations can be physically manipulated (i.e., subdivided, modified). It is believed that innovations possessing such attributes will spread more quickly than innovations that cannot be modified, subdivided or otherwise manipulated. It would seem that such characteristics would be useful in adapting the innovation to diverse educational contexts as well as enhancing its appeal to a wider range of potential adopters.

The general concept or attribute of divisibility can be directly traced to the work of Rogers (1962) and Rogers and Shoemaker (1971) and particular research completed in rural sociology, agriculture, and medicine (see Fliegel and Kivlin, 1966; Fliegel and others, 1968; Gross, 1942; and Katz, 1961 for example). Trying an innovation on a partial basis or on the "installment plan" (Rogers and Shoemaker, p. 155) increases the chances for adoption according to these researchers. Empirical evidence in these research traditions is not especially convincing and is certainly suspect when applied to educational innovations and settings. Some innovations can be easily divided and tried out on a partial basis; however, many do not lend themselves to such manipulation (i.e., driver training or open classrooms). Farmers and doctors have routinely practiced such tactics in observing the effects of hybrid seed corn, weed sprays, angina medications, and other pharmaceuticals. Divisibility, or "trialability" (Rogers and Shoemaker (1971) changed the term in the second edition to reflect the notion of a psychological trial) may pertain to educational innovations, but the evidence uncovered fails to substantiate the generalizability of this attribute.

Differences between a "technology or thing" and educational innovations (see Guba, 1968; Berman et al, 1975 for example), differences between unitary adopters (farmers and doctors) and collective or authority innovation-decisions (schools), and differences between organizational and market influences (see Pincus, 1974, and Miles, 1964 for example) all raise questions related to Generalization 3.3. Studies by Havelock (1973a), Wolf (1970), and Wolf and Fiorino (1972) have documented the absence of a trial stage in the innovation-decision process of educators. Wolf (1970) reported:

> Users tend to adopt innovations for their practical utility without benefit of a trial stage and then continue to use them as part of their practice (unless the innovations create major woes) (p. 2).

In another study, Allan (1977a) reported on his educational research and concluded that divisibility (trialability) was the most questionable of the attributes of innovations reported by Rogers and Shoemaker (1971). Hence, completed educational research, designed to test the ubiquity of this factor to educational settings, fails to support the importance of a trial stage, observing the innovation on a partial basis, or dividing the innovation into parts.

Reducing the risks associated with new practices, programs or products through incremental adoption (divisibility) was advocated by some educational sources (see Holloway, 1975; Huberman, 1973; Giacquinta, 1973; and Watson, 1972). For example, Giacquinta (1973) advised that:

> ...some organizational innovations can be tried on a short-term, partial basis without distorting their basic nature. Such trials allow their effects to be judged more accurately when put into full operation. Using audio visual aids in one class for one semester does not mask their effects, and extrapolating from

> the partial trial provides a reasonable estimate of their value. Trying other organizational innovations on a partial basis, however, may distort their nature. For example, a school with one open classroom is different in essence from a school totally composed of open classrooms (pp. 182-183).

Holloway (1975) identified a similar outcome in his study:

> Adopters appeared to prefer to try the innovation on a limited basis before expanding. Further, the innovation possessed the characteristic of divisibility which may have been so perceived by adopters and thus increased the likelihood of adoption (p. 11).

Larsen and Rogers-Agarwala (1979) identified some interesting empirical correlations related to modifications and reinventions of innovations. Although their research reanalyzed data from a mental health facility, it provides suggestive outcomes for further research in educational settings.

The review of the educational literature revealed few specific studies which investigated the divisibility or trialability of an educational innovation. Most of the studies reported on groups of attributes, some of which included references to divisibility. Of the research identified that supported the attribute, few studies contained rigorous designs that would insure reliability. Anecdotal references and theoretical papers derived from the multi-disciplinary research (Rogers and Shoemaker, 1971) comprised the majority of support for the generalization. While the research that does not support the generalization is hardly exhaustive, it suggests the need for much more carefully designed investigations into this attribute.

It is believed that the studies identified in Figure 3.3 represent fairly reliable distinctions as to the relatedness of divisibility. De-

spite every reasonable effort, there are additional studies which could not be identified within the efforts of the present literature search.

FIGURE 3.3

Generalization 3.3 Successful linkage enterprise is positively related to the extent to which selected innovations can be physically manipulated (i.e., sub-divided, modified, etc.)

Support: Heathers (1967), Watson (1972), Huberman (1973), Giacquinta (1973), Chin 1974),* Holloway (1975)*

Percentage of studies supporting the generalization: 46%

Number: 6

No Support: Carlson (1965),* Wolf (1970), Wolf and Fiorino (1972),* Havelock (1973a), Hull and Kester (1974),* Allan (1977a,* 1977b)

Percentage of studies not supporting the generalization: 54%

Number: 7

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 13

Total number of empirical studies: N = 6 (all categories)*

Total number of non-empirical studies: N = 7 (all categories)

Interpretation of Data - Generalization 3.4 (Pilot Test). Generalization 3.4 relates successful linkage enterprise to the extent to which selected innovations can be pilot tested. It is believed that demonstrations of the innovation in action will enhance the probabilities of adoption. Therefore, the "observability" of the innovation makes it easier for the potential adopter to see the "results" of the innovation (Rogers and Shoemaker, 1971, p. 23).

Like Generalization 3.3 (divisibility/trialability), the importance of a pilot test or demonstration of the innovation stems largely from research reported in rural sociology, medicine and agriculture. For years, county agents have utilized agricultural experiment stations and selected demonstrations in nearby farms to facilitate the adoption of agricultural innovations. The use of a pilot test (partial tryout) or a demonstration (observability) appeals to reason. Many innovations are difficult to describe through interpersonal communication or printed materials and direct observation of such innovations is usually necessary to insure adoption. Despite the logic and appeal of such notions, educational sources identified reported limited success in explaining this attribute of an innovation as an important variable in educational dissemination and change.

For example, many sources pointed out the lack of success in "the lighthouse" demonstration projects sponsored by federal and private funds. In another case, Berman et al (1975) were puzzled in their observations of the lack of intra-school/intra-district diffusion of innovative practices. Many case studies emphasized that seeing a demonstration of an innovative practice in a nearby school or district created adverse effects - that is,

potential adopters felt "threatened" by the "success of the practice" or felt that the innovation would not work well in their setting because of different staffing, materials, and/or students. Pilot testing of an innovation was seriously challenged by research reported by Wolf and Fiorino (1972). The authors concluded that educators rarely rely on a trial period in the process of innovation adoption. As a result, educators differ starkly in their approach to innovation adoption as compared to farmers or doctors for example. Utilizing the outcomes of a pilot test or gathering data on innovative programs conducted in other schools or districts are activities that are systematic and comparative. Such activities are not usually attributed to educational practitioners.

In a related study, Leary (1976) investigated the effectiveness of nine faculty in-service training institutes to determine their effect in educational innovation adoption. Although not specifically designed to measure the influence of a pilot test or demonstration, Leary's results shed some light on the behaviors of educators in utilizing innovative presentations, workshops and related sources of information on innovations:

> ...participants were asked at the conclusion of formal activities whether the conference heightened their aspirations for innovation. Of those who responded positively, approximately 31% saw the conference as a source of information about educational innovations of interest. When asked six months later, only 10% approximately perceived the conference as somehow contributing to the adoption of an innovation... For 90% of this group - whose interest in innovations was likely greater than the educational community as a whole - the conference contributed nothing with regard to the adoption of an innovation; certainly this does not say much for these workshops as effective in securing the adoption of innovations by target audiences (p. 6).

Information reported by House and others (1972) synthesizes the points raised by Berman et al (1975), Wolf and Fiorino (1972) and Leary (1970):

> The fact that visitors valued the demonstration highly had little relationship with later adoption. Situational constraints in the adopting districts seemed to be of greater importance than the intrinsic characteristics of the demonstrated program or the process of the demonstration itself (p. 11).

Problems associated with actually setting up a pilot test in a cooperating school were suggested in studies by Havelock (1973a) and Carpenter-Huffman, Hall and Sumner (1974), Havelock (1973a) and advises change agents to be aware that:

> Even before an actual trial effort takes place, the client system should be committed to a plan or procedure for evaluating the trial and making a 'go-no-go' decision ... all too often, a so-called 'trial' experiment results in a permanent adoption simply because the client has no plan for evaluating and, if necessary, rejecting what does not work; he accepts it because it is there and for no better reason (p. 92).

Hence, while it would seem reasonable that innovations that could be pilot tested or demonstrated would be adopted more readily than innovations that could not be so demonstrated, many educational sources questioned the utility of such notions. Perspectives gleaned from these researchers reveal that:

1. there is little empirical evidence with which to establish positive correlations between pilot tests or demonstrations and subsequent adoptions;
2. practitioner modus operandi is generally not sophisticated or systematic - thus, strategies utilizing pilot tests or demonstrations do not correspond with the observed stages of educa-

tional innovation adoption;

3. practitioners tend to rely on locolite sources for the development of curriculum materials and develop new projects from locally initiated and well-known sources;
4. pilot tests are difficult to arrange and fit to local conditions - demonstrations may sometimes increase resistance due to a "not invented here" syndrome as well as professional and organizational concerns related to the "exportability" of the innovation.

In contrast, some sources, most usually case studies or theoretical papers of contention, argued for the importance of pilot testing or demonstrating an innovation. Marsh (1964) reported that the observability of an innovation, in this case PSSC curriculum, was more important than the training provided by the PSSC institutes (p. 264):

> What made teachers a majority (55 percent of those attending) was, apparently, the lack of PSSC classrooms near enough to look in on. They had no visible proof that the new materials worked under school conditions. ... When neighboring teachers were able to observe the materials in use, adoption spread year by year ... Diffusion, seems to have depended at least partially on a pedagogical judgment by teachers about the fitness of PSSC materials for ordinary classroom use. Such decisions, made on the basis of direct observation or firsthand reports, and multiplied by all PSSC users and institute participants, determined the commercial feasibility of the program (pp. 264-265).

Holloway (1975) analyzed that the observability of an innovation was related to its "communicability" and that the innovation's perceived compatibility (see Generalizations 3.1 and 3.2) affected how effectively it could be communicated to potential adopters. Parish (1976) advised that matching a solution (e.g., an innovation) to a need would be aided by "a

visit to a site where the proposed solution(s) are functioning" and that such demonstrations are "helpful in gathering more data on a fit" (p. 14).

Like Generalization 3.3 (divisibility/trialability), no specific empirical studies were identified that provided data on the relationship of a pilot test or demonstration to subsequent adoption. Although some anecdotal research sources questioned this multi-disciplinary attribute, comparative studies which might provide data on the importance of a pilot test versus the lack of a pilot test were not located in a scan of the literature. Whereas a comprehensive review of the literature was conducted, it is conceivable that other studies exist that would relate to Generalization 3.4. Despite this limitation, however, studies identified provide relative perspectives on what is known about Generalization 3.4.

FIGURE 3.4

Generalization 3.4 Successful linkage enterprise is positively related to the extent to which selected innovations can be pilot tested.

Support: Lippitt, Watson and Westley (1958), Marsh (1964), Richland (1965),* Kaser (1966), Heathers (1967), Brickell (1967) Havelock et al (1969), Carr and Meyer (1969),* Huberman (1973), Giacquinta (1973), Chin (1975),* Hahn (1974),* Holloway (1975),* Parish (1976)

Percentage of studies supporting the generalization: 60%

Number: 14

No Support: Carlson (1965), Leary (1970,* House and others (1972),* Wolf and Fiorino (1972),* Berman et al (1975),* Allan (1977a;* 1977b)

Percentage of studies not supporting the generalization: 30%

Number: 7

Inconclusive: Havelock (1973), Carpenter-Huffman, Hall and Sumner (1974)

Percentage of studies which are inconclusive: 10%

Number: 2

Total number of studies identified: N = 23

Total number of empirical studies: N = 10 (all categories)*

Total number of non-empirical studies: N = 13 (all categories)

Interpretation of Data - Generalization 3.5 (Complexity). Generalization 3.5 states that successful linkage enterprise is inversely related to the complexity of selected innovations. As a result, complex innovations spread more slowly than simple, easy-to-understand innovations. Once again, research completed in agriculture and anthropology has provided much of what is known about the complexity of innovations.

Havelock et al (1969) outlined useful distintions related to the complexity of an innovation:

> The word 'complexity' subsumes a number of attributes of innovations which contribute to making them difficult to disseminate. It may refer to the number of parts of the innovation, the number of behaviors or skills which must be learned or understood before adoption is possible, or the number of procedures required for effective maintenance over time... As Rogers notes, it is not so much the objective complexity of an innovation which determines its diffusibility as the amount of complexity as perceived by the receiver... Complexity may also bear an indirect relationship to adoption, in that it is sometimes difficult to understand the relevance of a complex technique to the problem at hand (8-41).

Rogers and Shoemaker (1971) described complexity as:

> ...the degree to which an innovation is perceived as difficult to understand and use. Some innovations are readily understood by most members of a social system; others are not and will be adopted more slowly... In general those new ideas requiring little additional learning investment on the part of the receiver will be adopted more rapidly than innovations requiring the adopter to develop new skills and understandings (pp. 22-23).

Paul (1977) synthesized three generalizations from the empirical sources he identified. Paul discovered, however, that "balancing" the compatibility of an innovation with the perceived complexity of an innovation was problematical. For example:

> The balance between complexity and compatibility presents a dilemma for developers of innovative products and programs. On the one hand, compatible and easily substituted innovations are more likely to be implemented successfully; but on the other hand, complex incompatible, behaviorally based innovations have greater impact. Clearly, a middle ground must be reached between trivial innovations easy to implement and significant innovations difficult to implement. Propositions related to the above generalizations are:
>
> The Greater the Relative Advantage Of An Innovation, Then the Greater the Likelihood of Implementation.
>
> The Greater the Complexity Of An Innovation, Then the Less Likely It Will Be Implemented and the Less Likely It is Trivial.
>
> The Greater the Compatibility Of An Innovation, Then the Greater the Likelihood Of Implementation and the Greater the Likelihood that It Is Trivial (p. 52).

Organizing and profiling the points raised by Havelock et al (1969), Rogers and Shoemaker (1971) and Paul (1977) revealed the following generalizations related to the complexity of an innovation:

1. The perceived "complexity" of an educational innovation is highly variable. That is, perceptions of the complexity of an innovation may differ among potential adopters or between school sites. Developers and linking agents may believe "that a particular product is easy to understand and is compatible with existing practices and behaviors in schools; however, teachers may perceive the product as complex and incompatible with prevailing practice (Paul, 1977, p. 51). Hoke (1970) compared the views of Carlson (1965, pp. 14-15) and Sarason (1966) on the introduction of modern math and discovered substantial gaps between these researchers' views on the complexity of the innovation and its subsequent adoption.

2. "Complex" innovations may hinder or interfere with assessments of other attributes of innovations (relative advantage, compatibility) which influence potential users to adopt or reject an educational innovation. Long term benefits or cumulative impacts on cognitive or affective learning outcomes (i.e., Head Start, kindergarten, innovative counseling or sex education classes) are sometimes masked by more immediate, short-range considerations.

3. "Complex" innovations usually require substantial retraining or continued in-service support and training to users of the innovation. The quality of this training as well as its duration has been questioned frequently. Hence, complex innovations may be rejected or discontinued due to inadequate support, poor preparation of in-service materials, or insufficient time to prepare for use of the innovation. As a result, complexity may be a relative factor when compared to the supporting services and materials which accompany its introduction. Heathers (1967) pointed out that "...most school systems lack the facilities for training teachers to utilize an innovation effectively... In-service teacher education programs in the new mathematics curricula, in team teaching, or in teaching reading to children who do not speak English, cannot be conducted effectively in a two-week summer workshop or in a course taught once a week at the end of the school day (p. 47.)"

Most all of the educational sources identified supported Generalization 3.5. The complexity of an innovation seems related to both the speed and extent to which the innovation is adopted. Studies by Wolf and Fiorino (1972) and Allan (1977a), while questioning other attributes, sup-

ported the attribute of complexity. Berman et al (1975) suggested that many of the implementation problems cited in their report were related to certain innovations (i.e., bilingual education). The complexity of the proposed change and the availability of continued support and training for help in implementing the innovation were key factors in explaining success or failure according to Berman et al (1975).

The complexity of an educational innovation can be viewed along a distinct three part continuum related to adoption and implementation. In the first instance, the perceived complexity of an innovation may cause key influentials (i.e., superintendents, principals, department heads, opinion leaders) to reject the innovation without benefit of its relative advantage or any other criteria. The innovation is viewed as difficult to understand or implies organizational restructuring that is widely resisted. Decentralized school decision-making, voucher systems, or mainstreaming handicapped students illustrate examples of this case. In the second instance, the perceived complexity of an educational innovation may not create as much resistance and the introduction and implementation of the innovation proceeds without much fuss. Developers and linking agents assist in training and developing human and organizational capacities for installing and using the innovation. Over time, however, the complexity of the change influences implementation and distinct "adaptations" or modifications in the innovation result. In many cases, these modifications may result in substantial variations between initial trial and continued use of the innovation. Innovative social studies curricula, teacher aides, career guidance programs and alternative school projects illustrate this second point on the continuum.

In the third instance, the perceived complexity of an innovation is not so great that resistance mounts and rejection is swift and immediate as in the first instance. The innovation is adopted, but discontinued at some later point. Whether instances of discontinuance are related to complexity is not known. Researchers have paid little attention to such matters as Holloway (1975) has pointed out:

> A separate consideration, the discontinuance of the innovation because of complexity remains to be examined. The source of concern was the within-course complexity... This was of interest, since it made a clear discrimination between perceptions of complexity related to adoption and perceived complexity related to continuance. The time span of 18 months was too short to furnish data on discontinuance (p. 10).

Hence, while educational sources supported Generalization 3.5, complexity was pictured along a three part continuum: (1) that complex innovations may be rejected and never implemented; (2) that complex innovations may be modified in use making them less complex or less difficult to use; and (3) complex innovations may be discontinued during use. These distinctions appear significant and require more systematic inquiry. Since complexity seemed so well-supported in the educational sources, the studies identified are most representative about what is known about Generalization 3.5.

FIGURE 3.5

Generalization 3.5 Successful linkage enterprise is inversely related to the complexity of selected innovations.

Support: Lippitt, Watson and Westley (1958), Sarason (1966), Lippitt et al (1967),* Havelock et al (1969), Hoke (1970), Sieber (1972),* Wolf and Fiorino (1972),* Huberman (1973), Chin (1974),* Hull and Kester (1974),* Hahn (1974),* Berman and McLaughlin (1974),* Holloway (1975),* Piele (1975), Greenwood et al (1975),* Bailey (1976), Allan (1977a),* Paul (1977),* Emrick et al (1977)*

Percentage of studies supporting the generalization: 100%

Number: 19

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 19

Total number of empirical studies: N = 12 (all categories)*

Total number of non-empirical studies: N = 7 (all categories)

Generalization 3.6 (Number of Problems Raised). Generalization 3.6 states that successful linkage enterprise is inversely related to the number of problems members of the targeted audience are able to raise about selected innovations. Hence, problems associated with the implementation and use of the innovation, the relative advantage of the innovation and the interest and support of members of the target audience in the innovation are major themes reflected in Generalization 3.6. Innovations which cause or create widespread opposition or resistance among members of the targeted audience will spread more slowly than innovations that do not create such problems or resistance.

The participation of members of the target audience in planning for change, the interest and commitment towards improved practice, and the availability of useful and well-planned training and support services for innovation adoption have all been mentioned as important aspects of successful linkage enterprise. Huberman (1973) has analyzed that the intrinsic characteristics of innovations are seldom as important as the subjective assessments made by individual members of the targeted audience. Attitudes towards the changes implied by the adoption or use of the innovation require close attention if successful linkage is to occur according to Huberman.

If innovations create major problems for members of a targeted audience, it would seem reasonable that adoption and use of the innovation would be delayed, if not impossible. Matula (1972) discovered that the age, experience, and amount of education of members of the targeted audience were not significant as factors "in explaining or predicting a teacher's willingness to use a new program (p. 8)." The expression of

teacher interest and the support of peers were the most powerful factors reported by Matula (1972).

Most of the educational sources scanned supported Generalization 3.6 in terms of the importance of the practice setting and the problems and causes of problems raised by members of the targeted audience. No sources were identified that provided any information which would challenge the relatedness of this multi-disciplinary generalization to educational dissemination tasks.

Studies by Lippitt et al (1967), Carpenter-Huffman, Hall, and Sumner (1974), Matula (1972), Miles (1967), Hanson (1968), Havelock (1973a) and McCarthy and Kuh (1979) all reported on important distinctions related to Generalization 3.6. Problems raised by members of the target audience seem derivative of other attributes of the innovation which have been shown to affect decisions to adopt or reject an innovation - namely, compatibility with needs (Generalization 3.1), compatibility with existing practices (Generalization 3.2), and complexity (Generalization 3.5). That is, problems raised by members of the targeted audience are related to perceptions of the other attributes of an innovation and may vary according to these attributes as well as the particular organizational state of the practice setting. While technical and organizational change strategies are important, Hanson (1968) advises consideration of efforts to change people and their attitudes as a key to successful school improvement (p. 66).

Educational sources emphasized the importance of encouraging and sustaining innovative efforts and practices after initial trial and use (see Miles, 1964; Lippitt et al, 1967; Sieber, 1972; Berman et al, 1975 and

Emrick and Peterson, 1978 for example). Miles (1964) reported that "educational innovations which have a useful (and profitable) supporting set of materials appear to diffuse relatively rapidly; those without such a base tend to diffuse much more slowly, or to disappear (p. 35)." The need for continuing support and training in the use of educational innovations appears related to certain contingencies of the educational practice setting which are not found in other disciplines (agriculture, medicine, rural sociology). Whereas agricultural or medical innovations are subject to particular "market" influences (see Pincus, 1974; Lecht, 1969 and Guba, 1968), educational innovations seem to require substantially more assistance from a linkage agent to insure their adoption. It is believed that the "non-market" nature of educational enterprise accounts for the need for such sustained linkage agent assistance and support.

Since measurable increases in profit, lower costs, a decrease in discomfort, savings in time and effort, or immediate rewards (Rogers and Shoemaker, 1971, p. 139) are more difficult to demonstrate in educational settings as compared to agricultural or medical practice, Generalization 3.6 provides a useful means of explaining the interaction between particular innovations and members of the targeted audience. Attention to the inevitable problems of educational change and sustaining the interest of participating teachers, principals, parents and administrators appears a functional and logical necessity in light of the evidence uncovered.

FIGURE 3.6

Generalization 3.6 Successful linkage enterprise is inversely related to the number of problems members of a targeted audience are able to raise about selected innovations.

Support: Brickell (1964), Miles (1964), Sarason (1966), Lippitt et al (1967),* Hanson (1968), Hoke (1970), Matula (1972),* Fullan (1972),* Sieber (1972),* Huberman (1973), Havelock (1973a), Pincus (1974), Heathers (1974), Carpenter-Huffman, Hall and Sumner (1974), Berman et al (1975),* Bailey (1976),* Paul (1977),* Walz and Benjamin (1977), Emrick and Peterson (1978),* McCarthy and Kuh (1979)

Percentage of studies supporting the generalization: 100%

Number: 20

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 20

Total number of empirical studies: N = 8 (all categories)*

Total number of non-empirical studies: N = 12 (all categories)

Generalization 3.7 - (Information - Strengths and Limitations). Generalization 3.7 states that successful linkage enterprise is positively related to how well available information depicts strengths and limitations of selected innovations. Linkage agents who aspire to link the world of knowledge production with the world of knowledge utilization need reliable and objective information concerning the products and practices offered to potential adopters. For example, Wolf (1980) has pointed out that linkers associated with purveying innovations may encounter difficulties unless they are able to utilize some process of verifying the worthiness of their products, practices or ideas:

> Not enough is known about many of the new practices, products, and ideas made available in the social sciences to warrant enthusiastic advocacy of their adoption. Much of the knowledge production is ordinary knowledge; that is, the knowledge is not verified or certified in an objective manner. Ordinary knowledge, when utilized, often contributes to a 'change for the sake of change' phenomenon, rather than to specific improvements in practice (p.10).

Much of the linkage agent's stability of performance, within a given school site, or across diverse school settings, seems related to the quality of the information available about selected innovations. Linkers who advocate the adoption of educational products, practices or ideas which fail to produce intended outcomes risk future credibility with members of a targeted audience. Hence, Generalization 3.7 addresses the importance of reliable "product" information prior to innovation adoption.

Recent studies identified in the literature stress the importance of innovation-validation procedures. For example, Emrick, Peterson and Rogers-Agarwala (1977) found the services of the JDRP (Joint Dissemination

Review Panel) an important asset to facilitators and developers as well as users:

> ...the JDRP functioned as a clearinghouse, a legitimizing agency, an indicator of federal educational priorities, a quality control mechanism, and a target criterion for innovations ... from the adopter's perspective, the credibility of NDN innovations was in large part due to their national-level validation (p. 169).

Havelock (1973a) suggested that linkage agents inform potential adopters of anticipated consequences related to the adoption of particular innovations:

> Generate open but realistic expectations about the performance capabilities of new information systems and services. They should not be undersold or oversold. Any resource should be approached with a realistic view of what it is capable of giving (p. 94).

Hahn (1974) advised that pertinent data be made available to potential adopters:

> ...developers and change agents should make objectives and evaluation data available to potential adopters. Change agents and developers should demonstrate to potential adopters how they can minimize costs, risks, and the complexity of using innovations if they want potential adopters to develop favorable attitudes toward the innovation (p. 15).

Confidence in the innovation and confidence in the linkage agent are closely related aspects of how well available information depicts the strengths and limitations of selected innovations according to these educational sources.

Studies by Sieber (1972) and Paul (1977) reported some interesting perspectives related to Generalization 3.7. For instance, Sieber (1972) discovered that the interpersonal communication between change agent and user was responsible for encouraging and sustaining innovation interest

and use. Agents were not likely to be held responsible for poor information, since Sieber's model was designed to test "assistance," rather than specific program, product or practice "advocacy." Consequently, linkage efforts were user-oriented and not product-oriented. It seems reasonable to believe that the particular role played by the agent might influence the degree to which he/she would be held responsible for the quality of innovations adopted. Current roles and responsibilities related to linkage tasks (see 1.0 Linkage Agent) leave many of these questions unanswered.

In a related approach, Paul (1977) analyzed that simply providing information was inadequate in light of the need for facilitating activities:

> Producing and providing information and curriculum guides are not sufficient for assuring their use. To influence positively the amount and extent of use of new knowledge, one must engage in facilitating activities. These activities range from providing sufficient amounts of help in using new curriculum guides, fashioning new information so that it is accessible, interpretable, and understandable, to training teachers, providing encouragement, and stimulating confidence. The need for facilitating activities is based in part on built-in resistance users have to new curricula and information, based on their need to protect themselves from information overload, to protect their limited time and energy, and to protect themselves from difficult, esoteric, or unworthy techniques (pp. 40-41).

Hence, educational sources identified stressed the importance of Generalization 3.7, while at the same time, differing in their approaches as to how involved linkage agents should become in such information-verification activities.

Barton and Wilder (1964) commented on the consequences that occur in situations where accurate information on innovative practices is lacking:

> But the decision to alter methods and materials can hardly be made on a rational basis when there exists virtually no hard evidence as to the superiority of one system over another. In the absence of such evidence, factors such as educational ideology, persuasive ability of book salesmen, sentiment, or exaggerated claims for specific methods may determine how children are taught to read in a given community (p. 396).

Persuasion and exaggeration were mentioned by Carpenter-Huffman, Hall and Sumner (1974) as related to the introduction of performance contracting in schools. Since the sponsorship of change is risky and rewards are few, great effort is needed to convince members of the targeted audience that innovation adoption is worthy according to these authors. Consequently, "to get decision-makers interested in a change makes it difficult to get them to be rational about implementing that change (p. 54)." Whether other or similar examples of the role played by information in educational linkage activities exist is not known. However, sources identified seemed to be in relative agreement concerning Generalization 3.7.

FIGURE 3.7

Generalization 3.7 Successful linkage enterprise is positively related to how well available information depicts strengths and limitations of selected innovations.

Support: Fox and Lippitt (1964),* Barton and Wilder (1964), Miles (1964), Chin (1967), Sieber (1972;* 1973), Fullan (1972),* Wolf (1973), Havelock (1973a), Hahn (1974),* Carpenter-Huffman, Hall and Sumner (1974), Emrick et al (1977),* Paul (1977),* Wolf (1980)

Percentage of studies supporting the generalization: 100%

Number: 14

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 14

Total number of empirical studies: N = 6 (all categories)*

Total number of non-empirical studies: N = 8 (all categories)

Summary of the Data Related to Part III, The Innovation - Generalizations 3.1 - 3.7. Results of the literature search are displayed below. The number of studies uncovered and the percentages of support, no support or inconclusive calculated on the basis of the research sampled are also shown.

Educational studies related to the characteristics of innovations comprise a major portion of the literature concerned with educational dissemination and change. Consequently, percentages represent only those studies identified. To systematically identify and categorize the hundreds of studies concerned with this topic proved impossible. However, it is believed that information presented in this section represents fairly reliable aspects about what is presently known about the innovation.

The present investigation uncovered the following results:

1. Generalization 3.1 (compatibility with needs):

   25 studies, 7 empirical, 100% support

2. Generalization 3.2 (compatibility with practice):

   24 studies, 7 empirical, 100% support

3. Generalization 3.3 (divisibility):

   13 studies, 6 empirical, 46% support, 54% no support

4. Generalization 3.4 (pilot test):

   23 studies, 10 empirical, 60% support, 30% no support, 10% inconclusive

5. Generalization 3.5 (complexity):

   19 studies, 12 empirical, 100% support

6. Generalization 3.6 (number of problems raised):

   20 studies, 8 empirical, 100% support

7. Generalization 3.7 (information-strengths and limitations): 14 studies, 6 empirical, 100% support

4.0 The Targeted Audience (Parts II and VI of the Methodology)

Parts II and VI, the Targeted Audience, of the Wolf-Welsh Linkage Methodology (1979) are summarized by five multi-disciplinary research generalizations:

4.1 Successful linkage enterprise is inversely related to the number of persons within a targeted audience.

4.2 Successful linkage enterprise is inversely related to the number of administrative units (i.e., schools) within a targeted audience.

4.3 Successful linkage enterprise is inversely related to the number of decision-making levels within a targeted audience.

4.4 Successful linkage enterprise is positively related to the extent to which members of a targeted audience participate in the linkage enterprise.

4.5 Successful linkage enterprise is positively related to the extent to which opinion leaders and other influencials within a targeted audience support selected innovations.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the fourth overarching variable, the Targeted Audience. And second, specific educational research outcomes are categorized and discussed according to whether they support, do not support or are inconclusive with regard to each of the five generaliza-

tions related to the Targeted Audience, Parts II and VI of the Methodology.

Thus, information in this section is presented in the following order:

1. perspectives on the research on the Targeted Audience;
2. review of specific research studies related to the Targeted Audience, Parts II and VI, of the Wolf-Welsh Linkage Methodology;
3. interpretation of data - Generalization 4.1 (number of persons);
4. interpretation of data - Generalization 4.2 (number of administrative units);
5. Interpretation of data - Generalization 4.3 (number of decision-making levels);
6. Interpretation of data - Generalization 4.4 (participation);
7. interpretation of data - Generalization 4.5 (support of opinion leaders);
8. Summary of research related to 4.0 the Targeted Audience.

Perspectives on the Research on the Targeted Audience (4.0). A review of the educational research sources related to characteristics of the targeted audience and the organizational setting produced the following generalizations:

- most of the research on the targeted audience and the organizational variables which affect the adoption of innovations has been completed in other research disciplines (i.e., rural sociology, business and agriculture);
- know-how derived from such research investigations does not seem to

generalize to educational settings in a predictable manner;

- little empirical evidence has been gathered from educational settings on the effects of organizational and target audience variables (i.e., size, numbers of persons or schools, bureaucratic structure, communication and decision-making patterns);
- and, data obtained from some educational research studies are often inconclusive or contradictory - see Carlson (1965) and Mort (1941).

Factors associated with the innovativeness of organizations have been well-researched and reported, particularly in agricultural and industrial settings. According to these sources, size, wealth and available resources are related to the propensity of organizations to adopt innovations. Typically, larger businesses and farms exhibit the capacity, both financial and institutional, to respond to market influences through the adoption of innovations. Havelock et al (1969) analyzed and reported on a study of 294 industrial firms (Mansfield, 1963) in which organizational size and the flow of information, both into and through the firms, were related. As a result, larger organizations adopt new technologies and information at a faster rate than smaller organizations (p. 6-10).

Unfortunately, efforts to generalize the quantity of empirical evidence from industrial, agricultural and medical research on organizational size and innovativeness to educational settings has proven to be a difficult task. Havelock et al (1969) theorized that larger organizations, with stable financial assets and well-organized administrative structures, would be in a better position to take risks with innovations (p. 6-19). However, financial assets alone do not guarantee that an educational organization will be receptive to new knowledge (see studies under Gen-

eralization 2.2). A dissatisfaction with current practice, as well as financial resources, account for the response or capacity of organizations to respond to new information or technologies (see studies under Generalization 2.1).

Three educational studies illustrate contraditions within the educational research literature. For example, Carlson (1965) reported that per pupil expenditures and the innovativeness of schools in Pennsylvania and West Virginia were not related. Mort (1941), however, found that per pupil expenditures were related to the willingness of a school district to adopt innovations. In a more recent report, Berman and Pauly (1975) theorized that larger and wealthier organizations would be more "conservative" in nature, yet their analyses showed that factors related to size and wealth were, in fact, related to the adoption of educational innovations. Three generalizations were derived from their study:

1. the variable with the largest effect on the propensity to adopt innovations is the size of a school district measured by enrollment (p. 137).
2. the effects of 'wealth' (controlling for size and other wealth-related characteristics) can be expected to affect the propensity to adopt innovations (p. 138).
3. the percentage of families with income of at least $25,000 increases innovativeness, whereas the percentage of families with income below the poverty level, combined with minority, decreases innovativeness (pp. 140-141).

Emrick et al (1977) pointed out that large, urban school systems, although accounting for a majority of their sample, were responsible for the fewest adoptions (20%) of NDN (National Diffusion Network) innovations.

Giacquinta (1973) stated that the organizational properties of schools affect both the degree and speed of change. Some of these organ-

izational properties are unique to schools while others are common characteristics of all complex bureaucracies. Speculation, rather than empirical evidence, summarize most of what is known about the effects of school organization on innovation adoption according to Giacquinta (p. 197).

Havelock et al (1969) explained some of the ambiguities within the educational research literature as a product of two conflicting organizational forces:

> ...two conflicting forces in organizational dynamics are operating against each other to produce these conflicting results. 'Complacency' factor of organizations on the one hand acts as an 'inhibitor' when organizations are themselves operating at a high level already. The other is the 'risk capital' factor which is a force for innovation when organizations are functioning at a high level, which of these opposing forces is dominant in a given situation probably is determined by additional factors such as attitude and structure ... (p. 6-19).

The "openness" of the organization has been mentioned as a factor in the flow of information into an organization. Attributes of an open organizational structure include the leadership, coding scheme, social structure, local pride, status, economic conditions, linkage and capacity of the organization (Havelock et al, 1969, p. 6-3). Similarly, Hage and Aiken (1970) explained change in organizations as a result of greater complexity, less centralization, less formalization, less stratification, lower emphasis on volume of production, lesser emphasis on efficiency, and greater job satisfaction.

Research reported by Havelock et al (1969), Mansfield (1963) and Hage and Aiken (1970) provide useful summaries about what is known about organizational properties and the adoption of innovations. However, since

these sources utilized multi-disciplinary research bases, some researchers have questioned the utility and generalizability of their findings to educational linkage tasks.

A Review of Specific Research Studies Related to the Targeted Audience, Parts II and VI, of The Wolf-Welsh Linkage Methodology. A review of specific educational research studies which relate to the five generalizations comprising the Targeted Audience uncovered:

- few studies which specifically investigated the size of the target audience (Generalization 4.1); the size of the school or district (Generalization 4.2); or the structure and nature of educational decision-making processes (Generalization 4.3);
- a quantity of non-empirical studies which supported the importance of the participation of members of the targeted audience in planning and implementing change programs;
- and, few studies which reported empirical evidence or tested specific strategies of change in relation to demographic characteristics of the targeted audience.

Recently, more and more interest has been expressed in the linkage agent role in facilitating and sustaining school improvement activities. It seems reasonable to believe that the performance of linkage agents would be related to the five factors expressed in the Targeted Audience generalizations. The number of potential adopters, the location and number of individual schools or districts, and the nature of administrative organization and decision-making would seem to influence linkage agent activities and how well these activities are carried out. Studies by Littleton

(1970), Paul (1977), and Wolf (1980) support the need for more research in this area. However, despite the appeal of such logic, little empirical evidence exists with which to relate linkage agent performance to specific target audience variables.

In addition, specific organizational policies and capacities of schools and school districts would seem to influence the performance of linkage agents and the "success" or "failure" of the particular strategies these agents employed. For example, Daft (1974) investigated how educational organizations differed in terms of utilizing new information. Discrete attributes of the organizational structure, staff characteristics, and the structural arrangement of schools were identified as important influences in understanding the innovativeness of school districts. Total expenditures (unless utilized to employ teachers and certified support staff), size, complexity and "slack" resources appeared less important when organizational needs for innovation and idea processing capabilities were controlled according to Daft (1974).

Studies by Sullivan (1974), Wolf and Fiorino (1972), Littleton (1970), Paul (1977) and Walz and Benjamin (1977) suggest the need for further research into target audience and organizational variables which affect educational linkage tasks and the performance of linkage agents. Hughes (1971) labeled such organizational factors as "educational climates." Differences between innovative and non-innovative school districts were a function of organizational "openness", superintendent "thrust", and the enthusiasm of central office personnel. Wealth of the district was not nearly as powerful a predictor of innovativeness according to the data reported by Hughes (1971, pp. 27-30).

Havelock (1973) identified several types of linkages to the community and to resource specialists as important aspects of a district's "capacity" for utilizing new information. Size of the district (number of pupils) and per pupil expenditure were strongly correlated with innovativeness (pp. 84-86).

Giacquinta (1973) reported that while most educational researchers explain school improvement and change as a function of the attributes of innovations, characteristics of targeted audience, and characteristics of the linkage strategies and tactics, these conditions were not typically reflected in educational research studies. A lack of sound research procedures and a total absence of comparative studies convinced Giacquinta that it was impossible to determine the effects of different linkage strategies (pp. 188-189).

Earlier studies which reported information pertinent to linkage strategies seem to have been ignored in subsequent investigations. For example, Griffiths (1964) identified seven factors associated with change which suggest the importance of organizational size, decision-making, and linkage agent assistance:

> 1. The major impetus for change in organizations is from the outside.
> 2. The degree and duration of change is directly proportional to the intensity of the stimulus from the supra-system.
> 3. Change in the organization is more probable if the successor to the chief administrator is from outside the organization, than if he is from inside the organization.
> 4. The number of innovations is inversely proportional to the tenure of the chief administrator.
> 5. The more hierarchical the structure of the organization, the less possibility of change.
> 6. When change in an organization does occur, it will tend to occur from the top down, not from the bottom up.

> 7. The more functional the dynamic interplay of subsystems, the less change in an organization (pp. 431-435).

More recently, the Interstate Projection on Dissemination (1976) reviewed dissemination requirements in terms of the identification of the intended users or recipients of the information. Less than one-third of the legislation specifying dissemination-related requirements included references to intended target audiences (p. 23). Such omissions may account for the lack of well-coordinated linkages between federal and state agencies responsible for information dissemination and utilization.

In summary, although some work has been completed on the effects of target audience size and composition, organizational size, wealth and decision-making capacities, aspiring linkage agents will encounter both contradiction and controversy within the educational research literature. Whereas the participation of members of the targeted audience (Generalization 4.4) and the identification and support of opinion leaders and other influencials (Generalization 4.5) are well-supported in the sources identified, empirical investigation of these factors or comparative studies are absent.

Interpretation of Data - Generalization 4.1 (Number of Persons). Generalization 4.1 states that successful linkage enterprise is inversely related to the number of persons within a targeted audience. Logically, larger numbers or groups of potential adopters increase the likelihood that differences of opinion, problems of coordination, participation, and implementation will arise. Fewer adoptions were reported in large, urban school systems in a study by Emrick et al (1977). Two explanations of

this phenomenon were offered: "the complex bureaucratic structures characteristic of urban districts and the tendency of urban districts to describe their programs as locally developed rather than as adopted from a source outside the district (p. 132)." Whether aspects of the complexity of urban school bureaucracies are related to the size and number of persons who comprise the targeted audience is not made clear in the Emrick et al (1977) study. It seems reasonable to believe, however, that such factors are operative and provide some insight into the innovation adoption process.

Although target audience size seems related to the adoption of educational innovations and the strategies and tactics employed by linkage agents, few researchers have systematically investigated such relationships. A review of the educational research literature uncovered no empirical studies related to the number of persons who comprise the targeted audience. By inference, however, reports from Sieber (1972, 1973), Piele (1975), Hood and Cates (1978), Havelock (1973a), Paul (1977), Emrick et al (1977), Berman et al (1975), Springfield and Anderson (1979) and Emrick and Peterson (1978) suggest that target audience size is related to successful linkage enterprise. These studies stress the importance of the assistance of a linkage agent in encouraging and sustaining change activities (Sieber, 1972), the frequency of interaction between linkage agent and members of the targeted audience (Havelock, 1973; Paul, 1977; Emrick et al, 1977; Springfield and Anderson, 1979; and Emrick and Peterson, 1978), and the compatibility between the linkage agent and members of the targeted audience (see studies listed under Figure 1.3 - compatibility with target audience). Hence, the personal interaction and face-to-face

communication between linkage agents and potential adopters (Emrick and Peterson, 1978) necessary to insure the successful implementation of identified innovations seems influenced by a variety of situational factors - amount of time available for linkage agent enterprise, numbers of persons who comprise the targeted audience in relation to the linkage agent, and the personal and professional characteristics of the linkage agent, for example.

Studies by Paul (1977) and Emrick and Peterson (1978) seem to suggest that linkage agent influence is mediated by the size of the target audience. In addition, the performance of a linkage agent (see Firestone and Corbett, 1979; Wolf, 1980) is affected by a variety of factors - some of these factors are role and task specific - while others relate to specific organizational and targeted audience variables within the practice setting. The ability of a single linkage agent or small team of agents to affect the professional practice of several large districts or schools in a reasonable period of time seems unlikely. Skills and tactics prescribed for successful linkage enterprise (see studies cited under 1.0 Linkage Agent) imply regular meetings, training sessions and planning for change. For example, Fox and Lippitt (1964) discovered that channels of communication for sharing innovative practices were poorly developed in most schools. Intensive summer workshops, plus consultation, plus monthly clinic sessions produced the most sharing and innovation (p. 296). Mahan (1971) reported that successful consultant assistance to 21 pilot schools was positively related to maintaining intensive relationships with teachers and administrators, providing continuous appraisal and assistance to classroom teachers and presenting numerous demonstrations in classrooms

(reported in Giacquinta, 1973, pp. 193-194).

While none of the educational studies specifically correlated the size of the targeted audience with successful linkage enterprise, it is believed that these research studies imply such relationships. Despite the lack of empirical investigation, inferences were drawn from a variety of studies on the linkage agent role and two field study reports of classroom innovation and curricular change (Fox and Lippitt, 1964; Mahan, 1971) to illustrate what research (or lack of research) was uncovered for Generalization 4.1. More research, designed to establish the influence and effect of target audience size to linkage enterprise, is obviously needed.

FIGURE 4.1

Generalization 4.1 Successful linkage enterprise is inversely related to the number of persons within a targeted audience.

Support: Fox and Lippitt (1964),* Mahan (1971),* Sieber (1972,* 1973), Havelock (1973a), Piele (1975), Berman et al (1975),* Emrick et al (1977),* Paul (1977),* Hood and Cates (1978), Emrick and Peterson (1978),* Springfield and Anderson (1979), Firestone and Corbett (1979),* Wolf (1980).

Percentage of studies supporting the generalization: 100%

Number: 14

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 14

Total number of empirical studies: N = 8 (all categories)*

Total number of non-empirical studies: N = 6 (all categories)

Interpretation of Data - Generalization 4.2 (Number of Administrative Units). Generalization 4.2 states that successful linkage enterprise is inversely related to the number of administrative units (i.e., schools) within a targeted audience. Like Generalization 4.2, the number of administrative units would seem related to linkage activities. Hence, in addition to the size of the target audience, the organizational and physical arrangements of schools and districts, are thought to be related to successful linkage enterprise.

Most of what is known about the relationship between innovation adoption and organizational size (number of units of change) derives from research in rural sociology and agriculture. In both fields, significant information has been gleaned from field agents and researchers regarding information flow and resource utilization and the number of organizational units (see Rogers and Shoemaker, 1971). In large part, most of what is known about organizational size and the physical configuration of target settings (units of change) in education derives from such multi-disciplinary research. Havelock et al (1969) have written that certain "spatial mechanisms" can be used to facilitate knowledge transfer. Physical distance and proximity can either impede or increase communication between groups (p. 6-36). The importance of individual units of change and the patterns of communication and interaction between potential adopters are important components of "social-interaction" theorists. Knowledge of innovations is spread through collegiate contact and personal interaction from first awareness to initial try-out and finally, to adoption. Opinion leaders and other influential members of the targeted audience (see Generalization 4.5) are important forces in "spreading the word" according to

social-interaction theory. Hence, the number of administrative units suggest that knowledge of innovations will be significantly affected by the number of schools, proximity of these schools to each other for opportunities to observe and share innovative practices, and the sophistication of communication channels which link schools and members of the targeted audience.

Walz and Benjamin (1977) commented on the importance of the size of the organizational setting and the effect on innovation adoption:

> The amount of distance between physical components of the client system and between work settings of the members, as well as psychological distance between and among individuals, has a profound impact on the adoption process. Physical or psychological separation makes it difficult for an innovation to spread through social interaction. Unless people can communicate, discuss, and share reactions, they rarely move past the awareness level of response (pp. 52-53).

Few teachers find opportunities to share, observe or communicate methods of instruction or curriculum innovations with other teachers. The physical separation of school sites or demonstration schools from each other accentuates such teacher "isolation" (see Kemble, 1977; Fox and Lippitt, 1964; Lippitt et al, 1967 and Lippitt, Watson and Westley, 1958). In addition, the location and distance and number of school sites or districts would seem a powerful force in mediating the influence of linkage agents and their activities.

Hage and Aiken (1970) found the complexity (number of particular job specializations within the organization) and the degree of centralization as properties of organizations which may affect change. Paul (1977) related the importance of common expectations and mutual cooperation between various educational levels (Generalization 4.3) as well as between

various educational units:

> Accurate Perceptions and Expectations Which Are Mutually Agreeable Between Organizational Levels (Intra-organizational) and Between Organizations (Interorganizational) Facilitate Change. (Moderately Firm) (p. 46).

In Paul's analysis, "conflicting expectations between organizations involved in a change program are also serious, as the more organizations involved, the greater the likelihood that misperceptions will develop. Misperceptions in turn can lead to dissatisfaction with the interorganizational effort and a corresponding lowering of expectations for the program and weakening of coordination and cooperation (p. 47).

In a similar way, Lippitt, Watson and Westley (1958) observed that the assistance of a friendly, but neutral intermediary was necessary to prepare the many subparts of the educational bureaucracy for mutual problem-solving. Resolution of problems between these numerous subparts precedes the additional communication necessary for successful school change (pp. 47-55). Consequently, factors such as time, effort, number of persons and number of schools must be taken into account before initiating change activities. In a more theoretical vein, Lippitt, Watson and Westley (1958) questioned the problem of school change through an appropriate definition of the unit of change:

> If the subpart is too small to cope with a given problem, it will be unable to change because of resistance originating outside the subpart, coming either from the larger systems in which it is embedded or from parallel systems to which it is related. If the unit is too large and includes semi-autonomous subsystems which are not directly involved in the change process, it may be unable to change because of resistance originating within the system (p. 55).

The size of the unit of change should be chosen in light of the specific change objectives according to these researchers.

Whereas some educational studies supported Generalization 4.2 specifically, most did not offer either descriptive or empirical support. Since little research related to the size of the targeted audience (Generalization 4.1) was uncovered, it is not surprising then that the number of administrative units (number of schools or districts) received a similar lack of attention in the educational research literature.

FIGURE 4.2

Generalization 4.2 Successful linkage enterprise is inversely related to the number of administrative units (i.e., schools) within a targeted audience.

Support: Lippitt, Watson and Westley (1958), Fox and Lippitt (1964),* Johnson (1964), Lippitt et al (1967),* Havelock et al (1969), Havelock (1973a), Berman and Pauley (1975),* Walz and Benjamin (1977), Kemble (1977), Paul (1977),* Emrick et al (1977)*

Percentage of studies supporting the generalization: 100%

Number: 11

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 11

Total number of empirical studies: N = 5 (all categories)*

Total number of non-empirical studies: N = 6 (all categories)

Interpretation of Data - Generalization 4.3 (Number of Decision-making Levels). Generalization 4.3 states that successful linkage enterprise is inversely related to the number of decision-making levels within a targeted audience. It is believed that administrative organization and influence can either facilitate or resist change activities. In addition, linkage agents can expect diverse outcomes between school sites as various decision-makers and administrative processes mediate and influence planning, coordinating and implementing linkage enterprise.

Havelock et al (1969) described three types of organizational "flow" - input, throughput and output - which characterize organizations and are influenced by the number of decision-making levels (p. 6-3). Most often, internal communication flow (throughput) is affected by organizational capacities. Daft (1974) found that the direction, support and enthusiasm of the superintendent and school board were important factors in implementing change. Information reported by Carlson (1965), Griffiths (1964), and Hughes (1971) showed the importance of the role of administrative support for change.

Decentralized organizational decision-making was mentioned by Hage and Aiken (1970, Havelock et al (1969), Daft (1974), Griffiths (1964), Chesler et al (1967) and Paul (1977) in relation to the innovativeness of schools. Paul (1977) related decentralization to the involvement and participation of members of the targeted audience:

> Involvement, participation, and decentralization influence the success of change efforts. Involvement and participation are usually the result of decentralized organizational structure. Widespread participation of staff at the early stages of a change program will help to create commitment to and identification with a change effort. In addition, intensive involve-

> ment provides opportunities for program planners to assess the extent to which school needs, as perceived by staff, are addressed by the change (p. 44).

Griffiths (1964) related less hierarchical organizational structures to facilitating influences which positively affect the adoption of innovations.

According to Havelock et al (1969), the status hierarchy of an organization derives from such forces as authority, prestige, control over others and responsibility (p. 6-22). The flow of information within the organization ("throughput") can be measured and categorized as either "horizontal" or "vertical." Factors associated with the status hierarchy of the organization will determine major internal patterns of communication flow (horizontal or vertical) and how effectively these subprocesses impede or facilitate the introduction of new information or technologies (pp. 6-4, 6-22, 23).

Hence, the number of decision-making levels is related to the transmission of information into and through the organization. Many decision-making levels within the organization (more centralized, less diffuse, more hierarchical) aid in the coordination and implementation of change programs (Paul, 1977, p. 44); whereas fewer decision-making levels (less centralized, more diffuse, less hierarchical) aid in the involvement, participation and awareness of members of the target audience in change programs (Paul, 1977, p. 44). Chesler et al (1967) observed:

> ...the objective structure of the school seems to have a different effect on adoption than on innovation. In those schools where the communication structure was more hierarchical, teachers adopted more often than in schools with a diffuse structure. However, in those schools where the communication structure was more spread or diffuse, and where almost everyone was

> linked to someone, teachers innovated and shared more than in schools with a hierarchical or non-diffuse structure (p. 73).

Havelock et al (1969) compared similar diffusion/utilization phenomena and advocated sustained investigation in order to determine the efficiency of democratic versus autocratic administrative practices in promoting educational innovations (p. 6-24).

Implications from the research uncovered seem vital to the strategies and tactics utilized by linkage agents. Although the research related to Generalization 4.3 is sparse, the suggestions and importance of additional research are numerous. For example, if numbers and styles of administrative levels differentially affect both adoption and implementation (Chesler et al, 1967), then such influence needs to be taken into account by linkage agents. In this way, linkage agents would need to assess the decision-making structures of targeted schools or districts and improvise strategies based on the extent and degree of administrative authority. In some cases, the "success" of the linkage agent would be related to:

- promoting and "selling" high-level decision-makers on the merits of the proposed change;
- utilizing the centralized decision-making structure to advocate change activities from the "top-down";
- consulting and providing necessary information to key decision-makers involved with coordinating and evaluating change activities;
- motivating and involving members of the target audience in change plans and helping to create channels of communication between change participants and decision-makers.

In other cases, the "success" of the linkage agent would be related to:

- coordinating the development of long range plans with participating members of the target audience;
- organizing materials and other resources necessary for successful implementation;
- consulting and assisting in the development of organizational and administrative processes to channel change efforts towards specified objectives;
- facilitating channels of communication among participating members of the targeted audience and communicating results of change activities to higher-level decision-makers.

The activities suggested above, although hypothetical and somewhat general, illustrate distinct differences in linkage agent tactics constructed from opposing models of administrative decision-making described in the educational research literature. Additional research on these topics as well as reports from linkage agents already in the field are required before firm correlations could be established.

FIGURE 4.3

Generalization 4.3 Successful linkage enterprise is inversely related to the number of decision-making levels within a targeted audience.

Support: Griffiths (1964), Johnson (1964), Carlson (1965),* Chesler et al (1967),* Lippitt et al (1967),* Havelock et al (1969), Hughes (1971), Havelock (1973), Daft (1974),* Paul (1977)*

Percentage of studies supporting the generalization: 100%

Number: 10

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 10

Total number of empirical studies: N = 5 (all categories)*

Total number of non-empirical studies: N = 5 (all categories)

Interpretation of Data - Generalization 4.4 (Participation). Generalization 4.4 states that successful linkage enterprise is positively related to the extent to which members of a targeted audience participate in the linkage enterprise. It is believed that such participation and involvement in planning and implementing change activities influences change outcomes.

With one exception (Giacquinta, 1973), educational sources scanned supported the importance of the participation of members of the targeted audience in linkage enterprise. According to Havelock et al (1969), Pellegrin (1966), Gallaher (1964), Lin et al (1966), and Chesler and Fox (1967) stressed that the acceptance and predisposition of potential adopters towards the innovation is increased through participation. Miles and Lake (1967) advocated change agents to utilize a "focal group" composed of the superintendent and other administrators in addition to all members of the school or district affected by the proposed changes.

The Far West Laboratory for Research and Development (1976) advocated broad-based participation and support for change:

> ...the actual decision to try the new program must be a joint one, involving administrators, teachers, parents, board members, and other citizens. In adoptions, teachers and administrators need peer and community support. If a new and innovative program is to be supported beyond the tryout period, it must be publicized and made known to the community; it must be evaluated; and the results must show success. Since the effectiveness of a new program depends greatly on the people managing and teaching it, they must be involved in the decision-making and feel some ownership in it (p. 58).

Klein (1969) and Watson (1969) reported that potential resistance to change programs is lessened when members of the targeted audience are

involved and feel the program is their own. Hence, participation and involvement were almost universally endorsed and advocated by a variety of educational studies uncovered.

Giacquinta (1973), however, has questioned such overwhelming advocacy of participation strategies on a number of levels. "Conflicting demands, exacerbation of differences among members of the targeted audience, and a greater reluctance to try change" are three possible outcomes of participation strategies which are not reported in the literature (p. 189). Hence, while participation may solve some linkage problems, additional and unanticipated problems may result. On another level, Giacquinta (1973) raised certain questions about the validity of the educational research evidence and the lack of comparative studies which might establish the efficiency of participation strategies versus non-participation strategies:

> ...the participation of subordinates is a principle that Havelock et al (1969) have characterized as a 'general law of innovation'. However, research evidence to support the 'law' is spotty and has serious conceptual and methodological ambiguities. Only a limited number of articles report the effectiveness of introducing change from the top by superordinates without the participation of subordinates. The evidence fails to demonstrate the extent to which strategies of participation affect the process as compared to strategies of imposition from the top or to examine the reasons for expecting such relations. Moreover, it is often difficult to compare studies because their definitions of participation are unclear or varied. The variety of meanings include the extent to which members influence decisions of the group, are involved in group decisions without necessarily influencing decision-making, or are present in group situations where decisions are made (p. 185).

It is believed that the questions raised by Giacquinta in 1973 have, as yet, to be satisfactorily answered. And whether empirical comparisons be-

tween democratic and autocratic linkage strategies (called for in 1969 by Havelock et al) have been similarly investigated is not known.

Studies identified in Figure 4.4 represent sources identified in the present investigation. Whereas every effort was made to uncover research related to Generalization 4.4, additional references exist related to the extent of participation of members of the targeted audience.

FIGURE 4.4

Generalization 4.4 Successful linkage enterprise is positively related to the extent to which members of a targeted audience participate in the linkage enterprise.

Support: Lippitt, Watson and Westley (1958), Gallaher (1964), Fox & Lippitt (1964),* Lin et al (1966),* Pellegrin (1966), Chesler et al (1967),* Miles and Lake (1967),* Chesler and Fox (1967), Watson (1967, 1969), Havelock et al (1969), Klein (1968), Sieber (1973), Cutter (1974), Peterson (1974), Berman et al (1975),* FWLFER&D (1976), Paul (1977),* Walz and Benjamin (1977), Emrick et al (1977),* Emrick and Peterson (1978),* Hull and Kester (1978),* Meyers (1979), Gilman (1979), Libby and Walz (1979).

Percentage of studies supporting the generalization: 96%

Number: 25

No Support: Giacquinta (1973)

Percentage of studies not supporting the generalization: 4%

Number: 1

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 26

Total number of empirical studies: N = 9 (all categories)*

Total number of non-empirical studies: N = 17 (all categories)

Interpretation of Data - Generalization 4.5 (Support of Opinion Leaders). Generalization 4.5 states that successful linkage enterprise is positively related to the extent to which opinion leaders and other influentials within a targeted audience support selected innovations. Research completed in other disciplines (see, for example, Lazarsfeld and others, 1944; Katz, 1957, 1961; Havelock et al, 1969; and Rogers and Shoemaker, 1971) have reported and summarized the importance of opinion leader support to the diffusion of information through social systems.

Rogers and Shoemaker (1971) defined opinion leadership "... as the degree to which an individual is able to influence informally other individuals' attitudes or overt behavior in a desired way with relative frequency (p. 199)." In addition, such terms as "fashion leaders, gatekeepers, influencers, information leaders, key communicators, sparkplugs, style setters, and tastemakers" were identified by Rogers and Shoemaker (1971) as similar, yet related, concepts utilized by researchers to refer to opinion leadership. Havelock et al (1969) summarized various aspects of opinion leadership and the social system:

> That judgements and attitudes are influenced by the social environment is a well established fact in social psychology. People do have a tendency to conform to the opinions and behaviors of those around them, not only in unstructured situations, but even where there is direct sensory evidence which contradicts those opinions and behaviors... There is a large body of literature supporting the view that the vast majority of those who eventually adopt new ideas do so because they are influenced by some other member of their own group. When this pattern of imitation is focused on one particular person and is stable over time and across a number of innovations, we can speak of 'opinion leadership' (p. 7-11).

The influence of opinion leadership stems from research in mass communications, group work, and social psychology. Rogers and Shoemaker (1971) have identified a number of characteristics associated with opinion leadership and proposed a number of research generalizations related to these characteristics:

> EXTERNAL COMMUNICATION: Opinion leaders have greater exposure to mass media than their followers (p. 218).
> ACCESSIBILITY: Opinion leaders have greater social participation than their followers (p. 218).
> SOCIAL STATUS: Opinion leaders have higher social status than their followers (pp. 218-219).
> INNOVATIVENESS: Opinion leaders are more innovative than their followers (p. 219).

According to these sources, opinion leaders function as "conduits" or powerful interpersonal influences in spreading new information through the social system. The support and enthusiasm of such opinion leaders increases the likelihood that linkage enterprise will be successful.

Both structural characteristics of the system and persons within the targeted audience influence the acceptance of innovations according to Walz and Benjamin (1977):

> Cohesiveness in the group increases the intensity of resistance as well as the probability of adoption. The Change Agent should try to reach the informal leaders of these groups, for by winning their acceptance the whole group will likely follow along. Groups tend to be more conservative than individuals; however; when group cohesiveness is strong, the willingness to change will usually be less (p. 51).

Carlson (1965) discovered and measured opinion leadership in school superintendents and found such phenomenon useful in predicting the adoption of modern math. Personal attributes, professional status and preparation, interpersonal and group dynamics, organizational structure and communication patterns have all been mentioned as variables associated with opinion

leadership. Since both the time and degree of linkage agent influence are limited, opinion leaders are thought to be useful forces in extending linkage activities through their position and ability to affect the adoption of innovations. Planning and implementing change goals are dependent on the extended support of opinion leaders according to Generalization 4.5. Lippitt et al (1967) offered some useful perspectives on the social structure of schools and the influence of opinion leaders:

> There are two aspects of peer social relationships in the school that seem relevant for innovation and diffusion efforts. One that is seen by teachers is their own position in the peer social structure. For instance, if teachers believe that they have influence, they are likely to feel it is worthwhile sharing information with their colleagues. However, if they do not believe they have influence, or if they are alienated from the social system of the school, then they are likely to feel there is really no point in sharing because no one will listen. This observation is supported by data that reveal that teachers who are seen by their colleagues as influential, competent and enthusiastic about teaching innovate and share more than teachers who are not perceived in this way (p. 318).

Hence, personal influence is seen as a powerful factor in diffusing innovations in educational settings.

All of the educational sources uncovered supported Generalization 4.5. Two sources - The Change Agent's Guide to Innovation in Education (Havelock, 1973a) and On Becoming A Change Agent (Walz and Benjamin, 1977) - were most specific in endorsing the utilization of opinion leaders in linkage tasks. No studies were identified which would question the efficacy of enlisting opinion leaders in linkage tasks. Much of the multi-disciplinary research suggests that interpersonal and group dynamics generalize across a variety of settings - from peasants, to farmers, to doctors, to housewives, and to teachers. It seems reasonable to believe

that such opinion leadership would function in similar ways and no evidence was uncovered which would challenge such a notion.

FIGURE 4.5

Generalization 4.5 Successful linkage enterprise is positively related to the extent to which opinion leaders and other influentials within a targeted audience support selected innovations.

Support: Fox and Lippitt (1964), Miles (1964), Lippitt et al (1967),* Havelock and Benne (1967),* Miles and Lake (1967),* White (1968),* Havelock et al (1969), Watson (1969), Sieber (1972),* Paisley (1972), Havelock (1973a), Carpenter-Huffman, Hall and Sumner (1974), Peterson (1974), Piele (1975), FWLFR&D (1976), Parish (1976), Walz and Benjamin (1977), Guttinger and Hines (1977), Meyers (1979), McCarthy and Kuh (1979), Hayman (1979), Gilman (1979), Libby and Walz (1979).

Percentage of studies supporting the generalization: 100%

Number: 23

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 23

Total number of empirical studies: N = 5 (all categories)*

Total number of non-empirical studies: N = 18 (all categories)

Summary of Research Related to Part IV - The Targeted Audience. Results of the literature search are displayed below. The number of studies uncovered and the percentages of support, no support of inconclusive calculated on the basis of the research sampled are also shown.

Despite every reasonable effort to locate studies pertinent to the five multi-disciplinary generalizations related to the Targeted Audience, calculations represent only the research sampled. However, data obtained represent fairly reliable aspects of what is presently known and reported about target audience variables.

The present investigation uncovered the following results:

1. Generalization 4.1 (number of persons):

   14 studies, 8 empirical, 100% support

2. Generalization 4.2 (number of administrative units):

   11 studies, 5 empirical, 100% support

3. Generalization 4.3 (number of decision-making levels):

   10 studies, 5 empirical, 100% support

4. Generalization 4.4 (participation):

   25 studies, 9 empirical, 96% support, 4% no support

5. Generalization 4.5 (support of opinion leaders):

   23 studies, 5 empirical, 100% support.

5.0 Linkage Modus Operandi - Part VII of the Wolf-Welsh Linkage Methodology (1979)

Part VII, Linkage Modus Operandi, of the Wolf-Welsh Linkage Methodology (1979) is summarized by four multi-disciplinary research generalizations:

5.1 Successful linkage enterprise is positively related to the amount of time invested in identifying opinion leaders and other influentials within a targeted audience.

5.2 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between the person or persons responsible for the linkage enterprise and opinion leaders and other influentials within a targeted audience.

5.3 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between opinion leaders and other influentials within a targeted audience on the one hand, and other members of the targeted audience on the other hand.

5.4 Successful linkage enterprise is positively related to the amount of time invested in linkage enterprise by opinion leaders and other influentials within a targeted audience.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the fifth overarching variable, Linkage Modus Operandi. And second, specific educational research outcomes are categorized and discussed according to whether they support, do not support or are inconclusive with regard to each of the four generalizations related to Linkage Modus Operandi, Part VII of the Methodology.

Thus, inofrmation in this section is presented in the following order:

1. Perspectives on the research on Linkage Modus Operandi;

2. Interpretation of data - Generalization 5.1 (time invested to identify opinion leaders);
3. Interpretation of data - Generalization 5.2 (interpersonal communication with opinion leaders);
4. Interpretation of data - Generalization 5.3 (interpersonal communication between opinion leaders and others);
5. Interpretation of data - Generalization 5.4 (time invested by opinion leaders);
6. Summary of the research related to Linkage Modus Operandi.

Perspectives on the Research on Linkage Modus Operandi. There are a variety of major theoretical and conceptual models of educational change which have been reported in the research literature. Each of these models is based on certain assumptions regarding strategic factors of importance in educational change and each of the models indicates particular strategies and tactics associated with these assumptions. Reviews of these models can be found in Havelock et al, 1969; Havelock, 1973; Havelock in Eidell and Kitchell, 1968, 1969; Piele, 1975; Crandall, 1977; Butler and Paisley, 1978; and Hood and Cates, 1978 as well as a variety of related sources (see Rogers and Shoemaker, 1971 for example). Some elements of these major models feature extensive use of opinion leaders and other influentials to sustain the diffusion and utilization of selected innovations within the targeted audience.

The identification, solicitation of support, interpersonal communication, and utilization of opinion leaders and other influentials within a targeted audience are tactics which have been extensively utilized and

reported in anthropology, rural sociology, and medical sociology (see Rogers and Shoemaker, 1971, pp. 48-87 and pp. 228-248). These same tactics have been transported and used in a variety of educational diffusion efforts (see Carlson, 1965; Mort, 1964; Ross, 1958; Ross, 1952; and Sieber, 1972 for example). The assistance and support of "natural" opinion leaders in promoting the diffusion of innovations is important for a number of reasons:

- working through opinion leaders lessens possible gaps between the change agent and targeted audience, thus minimizing possible "heterophily" problems (see pp. 240-243 in Rogers and Shoemaker, 1971 and studies cited under Generalization 1.3 - compatibility with target audience);
- working through opinion leaders is time-saving for the change agent. Influence is spread through collaborative efforts of the agent and opinion leaders (Rogers and Shoemaker, 1971, p. 244);
- working through opinion leaders increases the credibility of the innovation and increases the probability of adoption (Rogers and Shoemaker, 1971, p. 244).

Of the major models of educational change, the utilization of opinion leader influence is most often reported in the Social-Interaction Model. Havelock (1973a) summarized five diffusion-utilization generalizations associated with the Social-Interaction Model:

> (1) that the individual user or adopter belongs to a network of social relations which largely influences his adoption behavior;
> (2) that his place in the network (centrality, peripherality, isolation) is a good predictor of his rate of acceptance of new ideas;

(3) that informal personal contact is a vital part of the influence and adoption process;
(4) that group membership and reference group identifications are major predictors of individual adoption; and
(5) that the rate of diffusion through a social system follows a predictable S-curve pattern (very slow beginning followed by a period of very rapid diffusion, followed in turn by a long late-adopter or 'laggard' period) (p. 159).

Comparisons between the five generalizations reported by Havelock (1973a) and associated with the Social-Interaction Model of educational change and the four generalizations comprising Part VII, Linkage Modus Operandi, reveal similar orientations. Hence, Generalizations 5.1-5.5 are derived from a large body of research - both multi-disciplinary and educational.

For example, Hughes (1971) and Hayman (1979) have argued that individuals within educational settings will be more effective in promoting the adoption of innovations than individuals from outside. Consequently, these researchers advocate the role of "internal" linkage agents. While "informal" and "natural" linkers/influentials exist in most educational settings (see Lippitt et al, 1967 for example), great care must be exercised in the selection of these individuals. Havelock et al (1969) have pointed out that while identifying and communicating with opinion leaders (as well as more formal leadership) are necessary and expedient; caution is warranted in light of the legitimacy of the change objectives:

> Anyone contemplating a program of diffusion should consider the implications of opinion leadership and legitimation. In a stable client system with identifiable and strong indigenous opinion leadership, it may be a wise strategy to take the opinion leaders as primary communication targets. But when this leadership is not strong, the attempt to make them inside change agents may alienate them from the rest of the client system and disrupt whatever community coordination may have existed previously. At the same time,

> to select members of the client system who are marginal in status and isolated from other members is equally fatal to a change program, unless some means are found for legitimating these insiders to their colleagues (p. 7-13).

Hence, the importance of opinion leadership is related to the degree of organizational cohesiveness and integration (the less cohesive and less integrated - the more important) as well as how accurately procedures for identifying these opinion leaders are developed.

Paisley (1972) recommended extended data gathering and needs assessment as well as the identification of natural networks of communication and opinion leaders (pp. 19-20). The extension of linkage agent influence and the development of self-renewal mechanisms within the user system were outlined by Parish (1976):

> During the course of working with the clients, some local people will have emerged as natural leaders in this adoption. These people can exist in any number of different roles in the school or district. The facilitator should be on the lookout for these local 'LINKers' from the beginning. When these persons are identified, the facilitator should provide some of the training and assistance in facilitating change that is given to the facilitator staff. If these people can be found and trained, it provides a regular on-site assistance to the school and district in making the change. If these natural leaders do not emerge, then there is a problem that has not been identified and it is wise to go slowly and examine your back trail. Finding these people and helping them become more effective and getting recognition has two major objectives: (1) It will greatly improve the chances of the current change being successful; (2) It leaves the client with the beginnings of a self-renewing process for his organization (p. 14).

Advocacy for determining user needs, problems and constraints, resources available for implementing change and typical channels of communication (both horizontal and vertical) utilized for decision-making represent im-

portant aspects of the user system which have been widely reported in the educational research literature. Within this context, the development and training of "internal" linkage agents, the increased participation of members of the targeted audience in planning change activities, and the utilization of identified opinion leaders and other influencials for increasing the extent of linkage enterprise have, in turn, been well supported in the educational literature.

Despite the quantity of educational research which supports the five multi-disciplinary research generalizations comprising Linkage Modus Operandi, little empirical evidence was uncovered that related to some of the variables in question. Comparisons between diverse linkage tactics and the extent of successful linkage enterprise were not identified in the course of the literature review. A body of theoretical and case study literature was discovered instead. Interestingly, the extent of assistance (quantity) and the use of interpersonal channels of communication received the most integrated support from both empirical and non-empirical sources. With time and resources limited, and expectations for performance high, linkage agent tactics are vital to successful linkage enterprise. Linkage modus operandi outlined in Generalizations 5.1-5.4 were commonly endorsed and utilized in the educational sources scanned. Factors related to role of the linkage agent (see 1.0 the Linkage Agent), however, mediate and affect which tactics are best employed under specific circumstances and settings.

Interpretation of Data - Generalization 5.1 (Time Invested to Identify Opinion Leaders). Generalization 5.1 states that successful linkage

enterprise is positively related to the amount of time invested in identifying opinion leaders and other influentials within a targeted audience. Hence, initial time and effort by the linkage agent to identify opinion leaders is justified in light of their relationship to successful linkage activity.

Studies by Walz and Benjamin (1977), Havelock et al (1969), Havelock (1973a), Parish (1976), Guttinger and Hines (1977), Sieber (1972), White (1968) and Paul (1977) imply connections between the time invested by linkage agents in identifying opinion leaders and change outcomes. The prestige, status and interpersonal interaction with other members of the targeted audience were three attributes of opinion leadership mentioned by Havelock et al (1969). White (1968) discovered important correlations between channels of influence, opinion leadership, and different types of educational issues (pp. 2-3). Paul (1977) found certain personality characteristics, usually associated with opinion leaders, to be positively related to change (p. 48). Although these studies emphasize the importance of opinion leader influence, the amount of time invested by the linkage agent is only implied in rather indirect terms. Such inferential support characterizes most of what was uncovered in the educational sources scanned.

Major studies of linkage agent functions (Piele, 1975; Hood and Cates, 1978; and Cates, 1978 for example) reported that no firm evidence exists with which to establish the primacy of functions or skills related to successful linkage agent performance. Consequently, it is difficult to establish firm support for Generalization 5.1. Time spent by a linkage agent to identify opinion leaders is, no doubt, a judicious and efficient

method of promoting the diffusion of educational innovations. However, neither the case study literature or the major reviews of linkage agent functions provide enough evidence with which to establish Generalization 5.1 as a definite part of linkage modus operandi.

Studies displayed in Figure 5.1 represent examples of the information uncovered. Whereas a comprehensive scan of the literature was conducted, it is believed that studies identified represent reliable aspects about what is known about Generalization 5.1.

FIGURE 5.1

Generalization 5.1 Successful linkage enterprise is positively related to the amount of time invested in identifying opinion leaders and other influentials within a targeted audience.

Support: Miles (1964), Lippitt et al (1967),* Havelock and Benne (1967),* White (1968),* Havelock et al (1969), Hughes (1971), Sieber (1972),* Paisley (1972), Havelock (1973a), Parish (1976), Public Affairs Counseling (1976), Walz and Benjamin (1977), Guttinger and Hines (1977), Paul (1977),* Hayman (1979).

Percentage of studies supporting the generalization: 83%

Number: 15

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: Piele (1975), Hood and Cates (1978), Cates (1978)

Percentage of studies which are inconclusive: 17%

Number: 3

Total number of studies identified: N = 18

Total number of empirical studies: N = 5 (all categories)*

Total number of non-empirical studies: N = 13 (all categories)

Interpretation of Data - Generalization 5.2 (Interpersonal Communication With Opinion Leaders). Generalization 5.2 states that successful linkage enterprise is positively related to the extent to which interpersonal channels of communcation are established between the person or persons responsible for the linkage enterprise and opinion leaders and other influentials within a targeted audience. Hence, in addition to the support of the proposed change (Generalization 4.5), the time invested to identify (Generalization 5.1); it is believed that interpersonal channels of communication between opinion leaders and the linkage agent are important aspects of linkage modus operandi.

Numerous studies have identified the importance of interpersonal, face-to-face communication between linkage agents and members of the targeted audience (see Havelock, 1973a; White, 1968; Emrick et al, 1977; Sieber, 1972; Paul 1977; and Emrick and Peterson, 1978 for example). Studies by Sieber (1972), Wiener (1972), Piele (1975) and Walz and Benjamin (1977) suggest that the frequency (quantity) of such interpersonal interactions are more important than the substance (quality). Piele (1975) analyzed Sieber's data from the Pilot State Dissemination Project and remarked:

> Interestingly, the assistance of the agent seem to be valued more than the information, and interpersonal contact was considered more useful than printed information... (p. 68).

Havelock et al (1969) reported that interpersonal sources were more often utilized by opinion leaders in situations where these influential members of the targeted audience sought information on new practices:

> ...the importance of face-to-face interpersonal contacts... The Opinion Leader is an important force in

> societal diffusion because he has a lot of friendly personal contacts with other members, and even he depends largely on word-of-mouth communication with local innovators and outside experts in building his own inventory of new ideas and practices (p 11-9).

Walz and Benjamin (1977) categorized and described the advantages of information-acquisition through interpersonal contact:

> In actual practice, people seldom have 'the facts' when making individual or group decisions. They commonly act on the basis of partial truths or personal biases, or from emotional stands. Very frequently the information available to decision-makers depends upon the means they use to obtain the information. Seeking the views of a close friend or a person assumed to be knowledgeable in a given area is a common means of acquiring information. It has the advantages of being easily retrievable (a telephone call will usually suffice), condensed (the information presented is usually very selective), interactive (the receiver can ask questions, clarify ambiguities) and frequently decisive ('In my view it's clear that the best course of action is...'). These advantages of interpersonal sources of information are important and help to explain why, when confronted with a decision, people typically will turn to another person for needed information (p. 63).

Paul (1977) discovered seven empirical studies which related to the importance of face-to-face interaction and two-way communication in conveying information:

> Face-to-face interaction allows mutual needs to be determined, messages to be adjusted according to reactions, and mutual influence to occur. These are characteristics of two-way communication, and they are absent from alternative modes of communication such as print media. Encouragement and support may be stimulated and nurtured through face-to-face interaction. This may be especially important at initial stages of change where resistance may be high and confidence low. Because it allows users to evaluate senders of information on one hand and it allows senders to demonstrate nonadvocacy of specific innovations on the other, face-to-face interaction also helps to develop legitimacy (pp. 41-42).

Hence, educational sources scanned provided a variety of perspectives on the utilization of interpersonal channels of communication in linkage enterprise. The effectiveness of interpersonal tactics appear to be positively related to overcoming initial resistance to change, maintaining enthusiasm and participation of change participants, and creating self-renewal capacities within the user system. Accordingly, studies identified in Figure 5.2 reveal overwhelming support for Generalization 5.2.

FIGURE 5.2

Generalization 5.2 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between the person or persons responsible for the linkage enterprise and opinion leaders and other influentials within a targeted audience.

Support: Lippitt, Watson and Westley (1958), Miles (1964), Lippitt et al (1967),* Havelock and Benne (1967),* White (1968),* Havelock et al (1969), Sieber (1972),* Wiener (1972),* Paisley (1972), Wolf and Fiorino (1972),* Havelock (1973a), Piele (1975), Berman et al (1975),* Parish (1976), Public Affairs Counseling (1976), Bailey (1976), FWLFER&D (1976), Emrick et al (1977),* Paul (1977),* Walz and Benjamin (1977), Emrick and Peterson (1978)*

Percentage of studies supporting the generalization: 100%

Number: 21

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 21

Total number of empirical studies: N = 10 (all categories)*

Total number of non-empirical studies: N = 11 (all categories)

Interpretation of Data - Generalization 5.3 (Interpersonal Communication Between Opinion Leaders and Others). Generalization 5.3 states that successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between opinion leaders and other influentials within a targeted audience on the one hand, and other members of the targeted audience on the other hand. Hence, Generalization 5.3 relates the influence, status, prestige and interpersonal communication of opinion leaders to the successful "spread" and promotion of linkage activities.

The efforts of opinion leaders are vital to the success of final change outcomes according to a variety of educational sources. The legitamacy of the proposed change as well as a sense of "ownership" and involvement of members of the targeted audience are influenced by opinion leaders and other influentials. Since interpersonal channels of communication are vital to the success of linkage enterprise, it seems reasonable to believe that these same tactics would be useful to identified opinion leaders. For example, Havelock (1973a) advised that change efforts depend on the support and endorsement of opinion leaders and the degree to which these members of the targeted audience communicate their support to less innovative members of the targeted audience (pp. 118-123). White (1968) reported that the very nature of opinion leadership is involved with interpersonal relationships. Both mediated and interpersonal channels of communication are influenced by opinion leaders according to White (1968, p. 3). Hence, opinion leaders both seek and share new information through interpersonal contacts.

The interpersonal influence and assistance of opinion leaders are related to the performance of linkage agents in a variety of ways:

- the amount of time and the number of persons within the targeted audience create conditions whereby opinion leader communication in support of the linkage enterprise is not only expedient, but necessary;
- information about proposed innovations as well as the characteristics of innovations may not be as important as the source of the information and the degree of interpersonalness between the source and receiver; and
- the participation and involvement of change participants is related to the frequency with which opportunities to acquire, discuss and share information are provided.

Since little evidence exists related to specific linkage agent training or function, studies related to Generalization 5.3 provide a partial means of explaining the lack of stability of linkage agent performance across diverse educational settings. No studies were uncovered which would question the utility of Generalization 5.3, although only White (1968) offered specific empirical correlations related to the factor.

FIGURE 5.3

Generalization 5.3 Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between opinion leaders and other influentials within a targeted audience on the one hand, and other members of the targeted audience on the other hand.

Support: Lippitt, Watson and Westley (1958), Miles (1964), Lippitt et al (1967),* Havelock and Benne (1967),* White (1968),* Havelock et al (1969), Sieber (1972),* Havelock (1973a), Parish (1976), Walz and Benjamin (1977), Emrick et al (1977),* Emrick and Peterson (1978)*.

Percentage of studies supporting the generalization: 100%

Number: 12

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 12

Total number of empirical studies: N = 6 (all categories)*

Total number of non-empirical studies: N = 6 (all categories)

Interpretation of Data - Generalization 5.4 (Time Invested by Opinion Leaders). Generalization 5.4 states that successful linkage enterprise is positively related to the amount of time invested in linkage enterprise by opinion leaders and other influentials within a targeted audience. Hence, time spent by opinion leaders as well as linkage agents is related to successful linkage enterprise according to Generalization 5.4.

Little research was uncovered related to the amount of time invested by opinion leaders. The absence of such research is not surprising given similar results of time invested by the linkage agent (Generalization 1.5) and time invested in identifying opinion leaders and other influentials within a targeted audience (Generalization 5.1). Although some inferential support exists for Generalization 5.4 (see Havelock, 1973a; Walz and Benjamin, 1977; Sieber, 1972; Hayman, 1979; Hughes, 1971; Piele, 1975 and Paul, 1977), most of the educational sources scanned provided little data related to the generalization.

Logically, greater amounts of time spent by opinion leaders in linkage activities would seem to be related to successful linkage enterprise. However, not enough data was uncovered to substantiate this factor to linkage modus operandi. Two factors are offered to account for the lack of evidence related to Generalization 5.4:

- diffusion/utilization research in educational settings is characterized by research designs and methodological factors which make the measurement of time invested by linkage agents and/or opinion leaders difficult, if not impossible;
- rigorous empirical studies or comparative research on diverse educational linkage strategies and tactics have not been reported in

the educational research literature in sufficient scope and detail to make firm conclusions about modus operandi factors possible.

Since a comprehensive review of the literature was conducted and little specific evidence uncovered, Figure 5.4 represents a direction for further research.

FIGURE 5.4

Generalization 5.4 Successful linkage enterprise is positively related to the amount of time invested in linkage enterprise by opinion leaders and other influentials within a target audience.

Support: Sieber (1972),* Havelock (1973a), Walz and Benjamin (1977), Paul (1977)*

Percentage of studies supporting the generalization: 100%

Number: 4

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 4

Total number of empirical studies: N = 2 (all categories)*

Total number of non-empirical studies: N = 2 (all categories)

Summary of the Research Related to Part V, Linkage Modus Operandi

Results of the educational research related to each of the five multi-disciplinary generalizations are displayed below. Whereas every effort was made to locate research related to these factors, it is believed that additional sources exist. As a result, studies uncovered in this section form a base upon which to build further evidence.

1. Generalization 5.1 (time invested to identify opinion leaders);
   15 studies, 5 empirical, 83% support, 17% no support
2. Generalization 5.2 (interpersonal communication with opinion leaders);
   20 studies, 9 empirical, 100% support
3. Generalization 5.3 (interpersonal communication between opinion leaders and others);
   12 studies, 4 empirical, 100% support
4. Generalization 5.4 (time invested by opinion leaders)
   4 studies, 2 empirical, 100% support

6.0 Outcomes, Part VIII and IX of the Wolf-Welsh Linkage Methodology (1979)

Part VIII and IX, Outcomes, of the Wolf-Welsh Linkage Methodology (1979) is summarized by two multi-disciplinary research generalizations:

6.1 Successful linkage enterprise is positively related to systematic evaluation of effects of selected innovations upon targeted audiences.

6.2 Successful linkage enterprise is positively related to systematic evaluation of linkage modus operandi utilized.

Data obtained are reported in two ways: first, perspectives of the educational research gathered are provided for the sixth overarching variable, Outcomes. And second, specific educational research outcomes are categorized and discussed according to whether they support, do not support or are inconclusive with regard to the two generalizations related to Outcomes, Part VIII and IX of the Methodology.

Thus, information in this section is presented in the following order:

1. perspectives on the research on Outcomes;
2. interpretation of data - Generalization 6.1 (evaluation of effects);
3. interpretation of data - Generalization 6.2 evaluation of linkage modus operandi);
4. Summary of the research related to 6.0 Outcomes.

Perspectives on the Research on Outcomes. The systematic evaluation of the effects and consequences of innovations on members of the targeted audience and the related evaluation of linkage modus operandi utilized to influence these adoptions has been widely supported in the educational research literature. For years, researchers have struggled with various problems associated with evaluation - some of these problems are related to general methodological issues, while others are related to the educational practice setting in particular.

For example, Brickell (1964) complained that the three distinct phases of change - design, evaluation and dissemination - are better recognized and logically separated in the fields of medicine, agriculture

and industry than in education (pp. 497-501). Instructional improvement is difficult, if not impossible, unless educators separate these three processes according to Brickell (p. 500). Havelock (1973a) advocated the importance of evaluation data to change agents, but pointed out that this kind of information is usually not available:

> Of special value (and special rarity) are research evaluations which use the fulfillment of specific behavioral objectives. Because of the specificity and observability of the measures in such cases, you will have little trouble in adapting them for use in your setting (p. 92).

Lippitt (1967) described the linkages between research and practice in education as retarded and chaotic:

> ...there is often a large volume of poorly described nonvalidated practices tempting uncritical adoption efforts by professional colleagues. On the other hand, there is a great volume of creative practice which remains invisible and inaccessible to review and consideration. This means that the diffusion of significant new practice is very retarded and chaotic (p. 76).

Inadequate procedures for identifying, documenting and validating new practices or products account for such confusion according to Lippitt (1967, p. 76).

Both Heathers (1967) and Watson (1967) identified similar problems in the lack of well-developed R & D approaches to school improvement and change:

> Few school systems have the services of research-trained persons and, in consequence, most local change projects lack adequate provisions for evaluating outcomes of the innovations being tried. A research approach is also needed to identify difficulties in implementing an innovation as a basis for improving the project design or the procedures used to implement the new program. Most change projects have not provided for gathering and using such feedback information (Heathers, 1967, p. 48).

Johnson (1964) documented the absence of systematic evaluation of Title III programs in California. According to his report, only 68 school districts out of 1,507 districts utilized any form of evaluation; and out of these 68, less than 10 districts met minimum requirements for scientifically designed and controlled research (p. 169). Johnson (1964) identified four reasons to account for this lack of evaluation:

> (1) adequate evaluation of program changes was difficult;
> (2) there was a lack of adequate supervisory/evaluation personnel;
> (3) there was a lack of suitable tests designed to measure changed objectives of instructional programs;
> (4) there was a lack of appropriate time elapsed since the introduction of the change (p. 169).

Eicholz and Rogers (1964) explained that procedures for the "measurement of worthiness of adoption" are not present in educational settings (pp. 314-315). That is, financial costs of innovation adoption can be calculated, but the long-term benefits which may accrue to students (learning outcomes) as a result of these innovations are difficult to evaluate or measure. Hence, few effects or consequences of the adoption of innovations are evaluated or described in educational practice.

Carlson (1965) pointed to a weak knowledge base about existing practices as a major factor which contributes to the difficulty of evaluating new practices. In such cases, Barton and Wilder (1964) believe that "educational ideology, the persuasive ability of book salesmen, sentiment or exaggerated claims for specific methods will account for how and why innovations are adopted or rejected" (p. 396).

Perspectives identified in these, as well as other educational research studies uncovered, support the need for systematic evaluation of

both effects on target audiences and diffusion strategies. However, the sources scanned provided a number of summaries of problems which affect evaluation:

- clearly defined change objectives are rarely stated in sufficient detail to make evaluation meaningful;
- measurement tools are poorly developed and not well-cogitated;
- school districts usually lack trained personnel or other necessary resources for evaluation; and
- student gains or outcomes are difficult to evaluate due to a weak knowledge base about current practice and effects and the length of time required to measure innovative outcomes.

Hence, although the evaluation of effects on targeted audiences and the evaluation of diffusion strategies and tactics employed (linkage modus operandi) were well supported in the educational research literature, most studies reported that such evaluations were infrequently and poorly conducted.

Interpretation of Data - Generalization 6.1 (evaluation of effects). Generalization 6.1 states that successful linkage enterprise is positively related to systematic evaluation of effects of selected innovations upon targeted audiences. It is believed that evaluations of change activities and effects and consequences within the targeted audience may relate to increased utilization of new practices, programs or products, additional adoptions and improvement within the user system, and the accumulation of information related to implementation and adoption which can be utilized in other settings.

Most of the major models of educational dissemination and change specify evaluation cycles. Comprehensive evaluation of diffusion tactics, strategies, and the extent of consumer adoption are outlined in a model developed by McCutcheon and Sanders (1974). Research reported by Sikorski and Hutchins (1974), Chin (1967), Allan (1977b), Kirkpatrick (1972), Goodman (1976) and Wolf (1975) emphasize and describe the importance of evaluating the effects of innovations.

Studies by Hahn (1974), Widmer (1973), Turnbull et al (1974), Brickell (1967), Havelock et al (1974) and Trump (1967) relate perspectives on the consequences of innovation adoption and evaluation to further innovation and school improvement. Educational sources scanned universally supported Generalization 6.1. However, it was noted that despite such support, few empirical evaluation studies were uncovered in the research literature. Most evaluations were of a case study variety and provided generally poor sets of criteria for assessing the impact of selected innovations upon members of the targeted audience. Hence, while demands for rigorous evaluation were widespread, the results of the present investigation discovered few studies which would qualify as rigorous or capable of providing generalizable data on the effects and consequences of innovation adoption.

FIGURE 6.1

Generalization 6.1 Successful linkage enterprise is positively related to systematic evaluation of effects of selected innovations upon targeted audiences.

Support: Brickell (1964), Johnson (1964),* Eicholz and Rogers (1964), Barton and Wilder (1964), Carlson (1965),* Lippitt (1967), Heathers (1967), Watson (1967), Chin (1967), Trump (1967), Kirkpatrick (1972), Havelock and Paisley (1972), Havelock (1973a), Widmer (1973), McCutcheon and Sanders (1974), Hahn (1974),* Turnbull et al (1974), Havelock et al (1974), Carpenter-Huffman et al (1974), Wolf (1975), Berman et al (1975),* Goodman (1976), IPOD (1976), Allan (1977b).

Percentage of studies supporting the generalization: 100%

Number: 24

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 24

Total number of empirical studies: N = 4 (all categories)*

Total number of non-empirical studies: N = 20 (all categories)

Interpretation of Data - Generalization 6.2 (evaluation of modus operandi). Generalization 6.2 states that successful linkage enterprise is positively related to systematic evaluation of linkage modus operandi utilized. In principle, data obtained from such evaluations can be used to (1) identify factors of importance in the diffusion and utilization of educational innovations, and (2) provide a means by which linkage agent strategies and tactics can be modified and revised according to the results obtained. It is believed that repeated evaluations, across a variety of target audience settings, will result in the identification of a series of generalizable sets of strategies and tactics which would result in more successful linkage enterprise.

Studies by Cates (1978) and Hood and Cates (1978) have indicated that the logical "testing" and evaluation of linkage modus operandi are not routinely found in the educational research literature. Berman et al (1975) reported that serious methodological and conceptual problems exist within the educational change literature and that most of the studies attempt to describe or advocate change, not to test theories of change or identify components of success of failure (pp. 3-5). Hence, while supporting Generalization 6.2, these studies emphasize what needs to be done in order to address this issue. For example, Berman and McLaughlin (1974) wrote:

> ...because these evaluations implicitly adopt a 'project model' that looks at an innovative program apart from its institutional context, it is difficult to generalize project outcomes to other settings. In short, the case study literature paints project accomplishments in glowing broadbrush terms, but it provides little information about specific successful innovative strategies, about the components necessary

> to success, or even about what constitutes success (p. 3).

Hence, what is suggested or thought to be proper policy is not always what occurs in practice. Sources scanned supported Generalization 6.2; however, it was noted that as Berman and McLaughlin (1974) pointed out, not much evidence exists with which to generalize successful or unsuccessful linkage modus operandi.

Studies identified in Figure 6.2 represent research uncovered in the present investigation. Despite every effort, it is believed that additional sources exist related to Generalization 6.2.

FIGURE 6.2

Generalization 6.2 Successful linkage enterprise is positively related to systematic evaluation of linkage modus operandi utilized.

Support: Chin (1967), Kirkpatrick (1972), Havelock (1973a), Wolf (1973; 1975), McCutcheon and Sanders (1974), Sikorski and Hutchins (1974), Havelock et al (1974), Piele (1975), Berman et al (1975),* Allan (1977b), Cates (1978), Hood and Cates (1978).

Percentage of studies supporting the generalization: 100%

Number: 13

No Support: None

Percentage of studies not supporting the generalization: 0

Number: 0

Inconclusive: None

Percentage of studies which are inconclusive: 0

Number: 0

Total number of studies identified: N = 13

Total number of empirical studies: N = 1 (all categories)*

Total number of non-empirical studies: N = 12 (all categories)

Summary of the Research Related to Part VI, Outcomes

Results of the educational research data related to the two generalizations are displayed below. Whereas a quantity of educational theory and contention support Generalizations 6.1 and 6.2, a number of sources mentioned that systematic evaluations of effects and linkage *modus operandi* are absent in most change programs.

1. Generalization 6.1 (evaluation of effects);

   24 studies, 4 empirical, 100% support

2. Generalization 6.2 (evaluation of linkage modus operandi);

   13 studies, 1 empirical, 100% support.

Orientation. In the early 1970's, Wolf conceptualized a theoretical configuration pertaining to linkage. Conditions for change, characteristics of the innovator or linking agent, characteristics of the innovation, characteristics of the target audience or adopting units and characteristics of the linkage strategies and tactics comprised the five major parts of Wolf's linkage configuration. Four antecendent variables, one manipulable variable, and three outcome variables (see Figure B, p. 12) were specified within this framework.

Wolf's theoretical configuration provided a frame of reference for the development of a unique and evolving educational linkage tool - the Wolf-Welsh Linkage Methodology (1979). However, certain questions emerged related to the generalizability of research derived from other disciplines and which were utilized by both Wolf (1979) and Welsh (1976) in the construction of the methodology. Twenty-six multi-disciplinary research generalizations were isolated that summarized major diffusion/utilization assumptions contained in the methodology.

A systematic analysis of completed educational research related to each of the twenty-six generalizations was conducted. In this way, an effort was made to determine similarities and differences between what researchers have reported about linkage across disciplines on the one hand and what researchers have reported about linkage within the discipline of education on the other hand. Information was obtained via standard searches of ERIC, Dissertation Abstracts, journals, books and other in-

formation repositories. Three categories - support, no support or inconclusive - were designed to categorize the nature of educational information uncovered for each of the twenty-six generalizations.

The generalizability and completeness of educational diffusion/utilization know-how has been questioned frequently. For example, educational decision-makers and researchers need to know answers to questions such as:

1. Are there linkage generalizations, based upon research completed in disciplines other than education, which can be legitimately utilized within varied educational contexts?
2. Are there linkage generalizations, based upon research completed in disciplines other than education, which should not be utilized within varied educational contexts?
3. Are there linkage generalizations, based upon research completed in disciplines other than education, which should be - but are not being - utilized within varied educational contexts?

Chapter Five is chronologically organized around the twenty-six research generalizations and the information which was uncovered and reported in Chapter Four. First, an overarching summary of the major findings for the five major parts of Wolf's theoretical linkage configuration are presented. And second, each generalization is restated and analyzed according to procedures outlined in Chapter Three. Conclusions and needed research are reported in each section and for each generalization and are summarized at the conclusion of the chapter.

1.0 The Linkage Agent (Part I of the Methodology).

Since 1975, more and more researchers have called for empirical investigations of the role and function of the educational linkage agent. Despite these urgings, not much has been done in the way of rigorous research. The sheer bulk of information pertaining to the linkage agent is staggering, yet deceiving. If quantity assured validity, then educational linkage agents would be guaranteed that precise and generalizable outcomes could be expected from current information concerning linkage enterprise. Unfortunately, in this case, the quantity of information seems partly responsible for masking the generally poor quality of research attention to the role and function of educational linkage agents.

For example, the majority of information reported in the literature can be classified into three categories:

(1) theoretical conceptualizations of the role and function of linkage agents;

(2) specific case study reports of linkage agent projects and programs;

(3) proposals and descriptions of training and support programs for linkage agents.

Despite the value and necessity of such investigations, the lack of empirical data can best be described by the following outline:

- no empirical references underlined any of the conceptualizations of the linkage agent role;
- few empirical references were generated from the case studies; and,

- no empirical references supported the training and support needs of the linkage agent.

There is virtually no hard evidence with which to explain the success or failure of linkage agents across varied educational contexts. Although numerous conceptualizations of the linkage agent abound, empirical "tests" or direct comparisons of these various conceptualizations are non-existent. No firm foundation exists to build a strong case for the efficacy of one role or function over another.

Many, if not all, of the current problems related to the linkage agent role - for instance, the marginality of the role, the institutional stability and "entitlement" of agents, and the stability of agent performance across diverse practice settings are related to the lack of a firm and validated knowledge base - a fact well documented in the educational reserach literature. More needs to be known about specific factors related to linkage agentry in order to further develop the functions and influence of this emerging educational role. Three overarching findings related to the linkage agent are presented in view of these perspectives:

- that research on understanding the linkage agent role is mired in descriptive effort which idealizes rather than clarifies the linkage agent role and function;
- while description and conception of the linkage agent role continues, few efforts have been initiated to measure the validity of these descriptions and concepts; and most controversially,
- that such descriptive research activity may oversubscribe functions and responsibilities to linkage agents whose role in

educational innovation/adoption may be marginal in comparison to other diffusion/utilization phenomena.

Specific outcomes of the five generalizations related to the Linkage Agent provide examples of these overarching findings.

Generalization 1.1 - Successful linkage enterprise is positively related to certain behavioral characteristics (i.e., reliability, ability to listen, punctuality, etc.) of the persons responsible for the linkage agent.

Only fourteen educational studies were uncovered that provided information related to Generalization 1.1 - and only four studies were categorized as empirical. While most of the studies ascribed various behavioral characteristics to the linkage agent role, none provided any specific correlations between these personal attributes and successful linkage enterprise. To what degree personal charisma and/or enthusiasm affect the outcomes of linkage agent activities can not be discerned on the basis of the educational research evidence.

Research is needed to clarify and define the relative influence of personal attributes from professional expertise in a way which would explain why some linkage agents succeed in some settings, but fail in others. For example, certain behavioral attributes (i.e., reliability, ability to listen, punctuality, etc.) need to be correlated within a framework which included professional expertise (Generalization 1.2), the degree of compatibility with members of the targeted audience (Generalization 1.3), and selected targeted audience variables (Generalizations

4.1-4.5). Such a framework is required in order to provide some baseline data on the stability of linkage agent performance across varied educational contexts. At present, little empirical evidence is available from which to develop a workable taxonomy of linkage agent skills - personal, professional, or institutional.

Generalization 1.2 - Successful linkage enterprise is positively related to the effective utilization of certain professional expertise (i.e., needs assessment expertise, communication expertise, evaluation expertise etc.) to successful linkage enterprise.

Twenty-five educational studies were uncovered that provided information related to Generalization 1.2 - and only five studies were categorized as empirical. Sixty-four percent of the studies (N=16) supported the generalization, whereas thirty-six percent (N=9) were classified as inconclusive. The inconsistency and division of support among the educational sources uncovered seems related to the lack of empirical investigation. The numerous and untested theoretical conceptualizations of linkage agent roles have lead to a proliferation of opinion and description regarding specific linkage agent professional expertise. Differences related to the primacy of skills and related functions associated with the different roles (i.e., process helper, solution giver, resource giver identified by Piele, 1975) have not been resolved in the educational research literature. Whether maximum payoffs can be expected to accrue from the development of specific training programs designed to train linkage agents seems questionable in light of the lack of research reported. Specifications

for some current linkage agent roles require a variety of specialized know-how - from research skills, to evaluation skills, to information retrieval and diagnostic skills and to communication skills. Hence, there is significant disagreement about the existence of a common series of linker functions and tasks.

Although many sources advocated the acquisition of specialized training and professional expertise for linkage agents, no educational studies reported relationships between these skills/expertise and successful linkage enterprise. Sizeable gaps exist between linkage agenct theory and linkage agent practice. An unwieldy number of research and process skills for linkage agents have been "stuffed" into these gaps between linkage theory and practice. As a result, efforts to sort out a reasonable set of skills and to fashion training programs around these identified "expertise clusters" have proven difficult.

Several studies pointed to specific areas for further research. The interpersonal assistance, interpersonal communication and frequency of interaction between agent and user are areas and topics highlighted by Emrick, et al (1977), Emrick and Peterson (1978), Sieber (1972), Paul (1977) and the Far West Lab for Educational Research and Development (1976). Additional investigation of outcomes identified in these studies should prove fruitful. Further research needs to narrow down and isolate more practical and generalizable areas of linkage agent expertise. The constraints and conditions of educational practice are significantly different when compared to medical, agricultural or industrial practice settings. Hence, while some attention to the expertise of USDA county extension agents or American Telephone and Telegraph or IBM "systems"

engineers is probably helpful; the continued reliance on these models (and the expertise implied in these models) may prove of little value or utility to the development of education linkage agent expertise.

Generalization 1.3 - Successful linkage enterprise is positively related to the degree of compatibility between the professional background and demographic characteristics of the person or persons responsible for linkage enterprise and the professional background and demographic characteristics of the typical member of a targeted audience.

Fifteen educational studies were uncovered that provided information related to Generalization 1.3 - and only four studies were categorized as empirical. Eighty-seven percent of the studies (N=13) supported the generalization, whereas thirteen percent (N=2) were classified as inconclusive. Although most of the educational sources supported the generalization, it was noted that little empirical data underlied this support.

It is impossible to determine the relative importance of compatibility between linkage agents and representative members of the targeted audience despite the logic of such a factor. The educational evidence is rather "soft" - mostly papers of contention - and some contradiction (see Firestone and Corbett, 1979 and Wolf, 1980 for example) was noted within the information uncovered.

Certain assumptions are contained in Generalization 1.3 that need further study. For example, research needs to be conducted that would begin to establish a base of knowledge about "internal" versus "external"

linkage agent status. The commonality of professional backgrounds and demographic characteristics between agent and user is suggestive of internal versus external linkage agent distinctions. Advocates for both roles exist. However, neither role has been experimentally validated to the degree which would insure confidence. Hence, more needs to be learned about Generalization 1.3 in order to determine internal versus external linkage agent roles and functions.

Generalization 1.4 - Successful linkage enterprise is positively related to the amount of time invested by a person or persons in linkage enterprise.

Eleven educational studies were uncovered that provided information related to Generalization 1.4 - and only four studies were categorized as empirical. Seventy-eight percent of the studies (N=8) supported the generalization, where as twenty-two percent (N=3) were classified as inconclusive. Educational sources most often ignored any attention to the amount of time invested by the linkage agent. Support for the generalization was largely inferential or anecdotal. Little, if any, educational research attention has been focused on time factors and Cates (1978) was the only source uncovered who treated such lack of research as a problem for future research.

The relationship between the amount of time invested by a linkage agent and successful linkage enterprise is an area which needs to be researched. Most of the major models of educational change imply time/status distinctions. In addition, the various theoretical conceptualizations of the linkage agent role suggest a number of aspects related to the

amount of time invested by the linkage agent. At present, none of these implications have been systematically addressed. Evaluations of linkage agent projects rarely account for the amount of time invested as a key variable in explaining the success or failure of linkage enterprise. Hence, there is virtually no hard evidence from which to further structure the central problem - are there differences in linkage outcomes, across varied education contexts, which can be explained by the amount of time invested (i.e., full-time or part-time, or time invested and measured by specific change projects or innovations)?

Generalization 1.5 - Successful linkage enterprise is positively related to the extent to which the person or persons responsible for linkage enterprise have experienced such success in the past.

Only one educational study (Cates, 1978) was uncovered that provided any information related to Generalization 1.5. The relative "newness" of the educational linkage role seems responsible for the absence of any detailed or empirical evidence. As a result, Generalization 1.5 stands as question for future research and development work to consider.

Summary and Conclusions - 1.0 The Linkage Agent. Although much has been said and written about the role and function of the educational linkage agent, the present investigation uncovered an extremely weak empirical knowledge base related to all five of the generalizations. There are some significant differences of opinion regarding the role, status, professional and personal attributes needed, location, training and support and relationship to the targeted audience of the educational linkage agent.

These differences do not appear inconsequential and should form the basis for future investigations.

More rigorous and comparative studies need to be done in order to determine more systematic ways of assessing the performance of linkage agents across a variety of targeted settings. Present research designs and evaluation data have not produced enough empirical know-how related to the five factors expressed in the multi-disciplinary research generalizations.

2.0 Conditions for Change (Part II, IV and V of the Methodology)

There was a quantity of educational evidence uncovered related to the three research generalizations under 2.0 Conditions for Change. Most notable were the relationships between the number of empirical versus non-empirical educational research studies for all three generalizations. For example, empirical studies were far outweighted by non-empirical studies in Generalizations 1.1 - 1.5 (Linkage Agent). However, educational sources related to the generalizations expressed under Conditions for Change (Generalizations 2.1 - 2.3) were much more evenly distributed:

- Generalization 2.1 (degree of dissatisfaction):

  44 studies supporting the generalization

  15 empirical; 34 percent of the total

  29 non-empirical; 64 percent of the total.

- Generalization 2.2 (resource potential):

  39 studies, 31 studies supporting, 8 studies inconclusive

  21 empirical; 54 percent of the total

  18 non-empirical; 46 percent of the total.

- Generalization 2.3 (past success):

  15 studies supporting the generalization

  7 empirical; 47 percent of the total

  8 non-empirical; 53 percent of the total.

These figures indicate that information reported in completed educational research studies on the three factors expressed in Generalization 2.1 - 2.3 are more integrated between empirical and non-empirical categories. Although a number of significant research questions still remain, a more solid empirical knowledge base was discovered for Conditions for Change.

Although the general outline related to the degree of dissatisfaction of members of a targeted audience, resource potential, and past success with change programs was widely supported by the educational information; some problems still remain. For instance, many educational sources reported diverse aspects of resource potential (Generalization 2.2) and their relationship to successful linkage enterprise. Certain pre-existing conditions within the organizational system of the targeted audience were identified as more important than financial or institutional resources in predicting successful linkage enterprise (see Berman et al, 1975 and Paul, 1977). Local intiatives, leadership, and past success in change programs seem related to change outcomes. The influence of federal or state funds on these pre-existing conditions is a complex issue, however. If conditions, both human nad organizational, affect and influence external linkage agent assistance projects; more needs to be known about these conditions.

At present, educational researchers appear to have described particular aspects of the targeted audience setting which influence linkage

agent enterprise and the success or failure of change programs. However, not much has been done beyond this identification and description. Efforts are needed to identify variables which can be manipulated and controlled (see Bennis et al, 1969, p. 193).

Generalization 2.1 - Successful linkage enterprise is positively related to a targeted audience's degree of dissatisfaction with practice earmarked for modification.

Forty-four educational studies were uncovered that provided information related to Generalization 2.1 - and fifteen studies were categorized as empirical. The overwhelming support for the generalization suggests that the degree of dissatisfaction with the practice earmarked for modification is a powerful factor related to the adoption of educational innovations. However, Havelock et al (1969) and Giacquinta (1973) have suggested that studies of educational change programs most often stress democratic or participatory approaches. As a result, few instances of autocratic or non-participatory change outcomes have been reported in the literature.

Generalization 2.1 connects the needs, motivations, dissatisfactions, and desire for change of members of the targeted audience to successful linkage enterprise. Strong correlations for these factors were uncovered in the educational sources. However, no information was discovered pertaining to change outcomes which were initiated by administrative action ("Multicultural texts will be used for all American history classes...") or legislative action ("Regardless of current local practice, all Massachusetts school systems must provide educational services for all child-

ren, ages 3 to 21, under Chapter 766..."). The lack of documentation and description of cases in which change is induced or created by administrative or legislative action prevents any comparisons to instances where the dissatisfaction and participation of members of the target audience are measured and reported as a factor in successful linkage enterprise.

Hence, more research needs to be conducted in order to determine differences and similarities between the influence of organizational conditions (needs, degree of dissatisfaction, resources and past success) and differing change intiatives (democratic versus autocratic).

Generalization 2.2 - Successful linkage enterprise is positively related to a targeted audience's resource potential (i.e., risk money, facilities, flexible staff, etc).

Thirty-nine educational studies were uncovered that provided information related to Generalization 2.2 - twenty one studies were categorized as empirical. A number of aspects of resource potential were identified in the sources uncovered. In general, existing facilities and staff, budgetary "slack," leadership and support for change, and time appear to be organizational and human factors which relate to successful linkage enterprise.

The influence of federal funds and the financial capacity of schools and districts appeared somewhat contradictory, however. Studies showed that the relative affluence of a given community was positively related to the propensity of these districts to adopt educational innovations. Urban school districts appeared the least innovative as a result of this factor

in a study by Emrick et al (1977).

Studies by Paul (1977) and Greenwood et al (1975) revealed that the availability of federal funds for innovative programs, products or practices failed to provide the necessary impetus to school districts where the motivation for seeking such funds was "opportunistic." These findings suggest that present methods of "stimulating" innovation adoption and linkages between research and practice in school districts through external assistance and funds need to be reexamined. Particular attention should be focused on urban school districts in order to determine how organizational and financial conditions in urban areas affect change projects in these districts. Additional factors or relationships between resource potential and the adoption of educational innovations could be identified from such investigations of urban school systems. The need for research in these areas is well supported and documented in the research literature.

Generalization 2.3 - Successful linkage enterprise is positively related to the extent to which members of a targeted audience have experienced such success in the past.

Fifteen educational studies were uncovered that provided information related to Generalization 2.3 - seven studies were categorized as empirical. All of the educational information uncovered supported the notion that past experience with change programs is a good measure of future expectations. There is not, however, strong empirical data to support this belief. Since large numbers of change project outcomes have been

reported, it would be interesting to correlate and compare these findings in order to develop a summative picture related to Generalization 2.3.

For example, resistance to change or the poor implementation of certain innovations may generalize to other efforts or to other innovations. It is just as probable that resistance and rejection phenonmena are situational and specific to particular programs or products. As a consequence, past success and experience with change programs is a rather shaky platform upon which to place important linkage decisions.

Intuition and some practical experience imply that Generalization 2.3 is a useful measure for predicting successful linkage enterprise. However, a number of factors - for example, little empirical evidence and more research designed to investigate responses of a district over longer periods of time and with different innovations and strategies - suggest that Generalization 2.3 should be a question for further research.

Summary and Conclusions - 2.0 Conditions for Change. In general, educational researchers have identified a number of factors which operate in schools and school districts that can either resist or facilitate change. These factors are scattered throughout the educational diffusion/utilization literature like pieces from an old puzzle. A quantity of empirical and non-empirical data exists with which to build some more integrated models of linkage and which would be particularly useful to educational linkage agents. Unfortunately, the modus operandi of most linkage agents seems unrelated to this information.

Suggestions for further research are many. Of special interest and concern should be questions such as: "How can federal and state funds and

linkage agent projects and programs have more of an effect on urban school systems which have the greatest need, yet show the poorest results from past efforts?"

3.0 The Innovation (Part III, IV and V of the Methodology).

The attributes or characteristics of innovations have traditionally received a great deal of attention from educational researchers. Decisions to adopt or reject an innovation are made on the basis of the perceptions of these attributes by members of the targeted audience.

Five of the multi-disciplinary research generalizations were supported by the educational sources. Generalization 3.3. (divisibility) and Generalization 3.4 (pilot test) were the most questionable of the attributes according to the educational evidence uncovered.

Most often the more rigorous empirical studies, which utilized sophisticated research methods to study the attributes of innovations, reported important differences from the more commonly accepted notions about the attributes of innovations. These findings suggest that more empirically designed research needs to be conducted. Several sub-attributes were reported by Allan (1977) and Hahn (1974) which further research needs to explore.

Generalization 3.1 - Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and identified needs of a targeted audience.

Twenty-five educational studies were uncovered that provided informa-

tion related to Generalization 3.1 - seven studies were categorized as empirical. The compatibility between selected innovations and the identified needs of a targeted audience seemed axiomatic within the educational sources uncovered. In fact, Generalization 3.1 forms one of the central pillars or supports in most of the models of educational diffusion/utilization which are reported in the literature, the logic, appeal and frequency with which references to the compatibility of innovations with identified targeted audience needs are mentioned may account, in part, for the absence of much empirical data to support this factor.

Matching or fitting specific innovations with specific needs is often mentioned as a primary task of educational linkage agents. However, neither the needs of a targeted audience or the specifications of educational innovations are ever clearcut. Berman and McLaughlin (1974) found difficulties in relating innovations to both treatments and to outcomes. Few educational studies have questioned or specifically investigated the complexities involved with systematically assessing, identifying and prioritizing the needs of targeted audiences. And second, few educational studies have reported on valid schemes for matching selected innovations to needs.

While the educational evidence supports the generalization, it is believed that most of this support rests on the surface of a number of implications that have not been thoroughly investigated. Matching and interfacing selected innovations to identified target audience needs is a crucial and antecedent step in a series of linkage tactics designed to promote more general diffusion and utilization activities within the targeted system. As a result, attention to aspects of Generalization 3.1 re-

quires further investigation.

Generalization 3.2 - Successful linkage enterprise is positively related to the degree of compatibility between selected innovations and the generally accepted professional practice of persons who comprise a targeted audience.

Twenty-four educational studies were uncovered that provided information related to Generalization 3.2 - seven studies were categorized as empirical. Resistance to innovations that implied major changes in the modus operandi of members of the targeted audience was well documented in the educational research literature. According to this view, educational change is characterized by gradual and incremental changes in practice. Adoption is positively related to congruence with practice.

Several case studies reported on the relationship of Generalization 3.2 to successful linkage enterprise. Paul (1977) suggested that highly compatible innovations may represent little more than substitutions to existing practice. Innovations which imply major changes or perturbations will be resisted. The scope of the change implied by the innovation relative to the targeted setting is positively related to adoption according to Berman et al (1975). These findings suggest that aspects of current practice are useful measures from which to assess the adoption of educational innovations.

Both the case study and theoretical literature supported Generalization 3.2 and its implications for educational linkage agents. It was surprising to discover only seven empirical references among the twenty-

four studies uncovered. In addition, few studies investigated the influence of leadership or resource potential on the compatibility of innovations with existing practice. For example, problems of implementation and incompatibilities between new programs (i.e., bilingual education) and existing practices might be ameliorated through positive endorsement for the change by influential administrators or through the efforts of linkage agents and sponsored workshops and training sessions. To what degree more complex changes can be introduced through the utilization of effective support systems - thus, reducing resistance and anxiety associated with major changes - remains a question for further research to explore.

Generalization 3.3 - Successful linkage enterprise is positively related to the extent to which selected innovations can be physically manipulated (i.e., sub-divided, modified, etc.).

Thirteen educational studies were uncovered that provided information related to Generalization 3.3 - six of the studies were categorized as empirical. Forty-six percent of the studies (N=6) supported the generalization, whereas fifty-four percent of the studies (N=7) did not support the generalization.

Of the six empirical references uncovered, four empirical studies reported information which did not support the generalization. As a consequence, Generalization 3.3. seems to be highly questionable as an important attribute of educational innovations. Dividing an innovation into parts for partial tryouts or modifying aspects of the innovation to enhance its overall appeal to potential adopters does not seem to relate

to increased adoption.

Obviously, more needs to be known about Generalization 3.3., since the information uncovered is hardly exhaustive. However, it is believed that further research will discover important dimensions related to Generalization 3.3 - particularly in ways suggested by Havelock (1973a), Wolf and Fiorino (1972) and Wolf (1970) that educators rarely utilize a "trail stage" in making decisions to adopt or reject an innovation. If systematic evaluations through modifications, pilot testings or demonstrations are not routine parts of adopters' behavior, certain attributes of innovations would be less likely to affect individual decisions related to diffusion/utilization matters. Additional research needs to be conducted in these areas since the educational data fails to support the generalizability of this multi-disciplinary attribute to educational linkage enterprise.

Generalization 3.4 - Successful linkage enterprise is positively related to the extent to which selected innovations can be pilot tested.

Twenty-three educational studies were uncovered that reported information related to Generalization 3.4 - ten of the studies were categorized as empirical. Sixty percent of the studies (N=14) supported the generalization, whereas thirty percent of the studies (N=7) did not support the generalization and ten percent (N=2) were inconclusive. The contradiction within the educational sources related to Generalization 3.4 raises questions about the efficacy of demonstrations or pilot tests for increasing the adoption of educational innovations.

Four factors were gleaned from the educational research evidence that

questioned the utility of pilot testing or demonstrating educational innovations:

(1) There is little empirical evidence to establish positive relationships between pilot tests or demonstrations and subsequent adoptions;

(2) Practitioner modus operandi is generally not sophisticated or systematic - thus, strategies utilizing pilot tests or demonstrations do not correspond with the observed stages of innovation/adoption in educational settings;

(3) Well-known and locolite sources were more often utilized by educators than information which was developed externally;

(4) Evaluations of change projects do not usually provide rigorous frameworks from which generalizable data on specific attributes of innovations can be identified.

It is believed that little empirical evidence supports Generalization 3.4 and that more carefully instrumented studies need to be completed. At present, Generalization 3.4 represents a multi-disciplinary generalization that is highly questionable in its applicability to educational linkage enterprise.

Generalization 3.5 - Successful linkage enterprise is inversely related to the complexity of selected innovations.

Nineteen educational studies were uncovered that provided information related to Generalization 3.5 - twelve of the studies were categorized as empirical. Both the theoretical and empirical research (a surprising 63% of the support) provided information related to the generalization.

Of the seven multi-disciplinary generalizations related to the Innovation, Generalization 3.5 received the most well-documented empirical treatment in the educational research literature. Such integrated support suggests that the complexity of an innovation is a powerful factor in educational linkage enterprise.

Further research might establish how different strategies and tactics affect problems of implementation and the perceived complexity of selected innovations. That is, if the complexity of an innovation influences adoption, how can linkage agents utilize particular tactics in order to insure significant implementations of more complex innovations?

Generalization 3.6 - Successful linkage enterprise is inversely related to the number of problems members of a targeted audience are able to raise about selected innovations.

Twenty educational studies were uncovered that provided information related to Generalization 3.6 - eight of the studies were categorized as empirical. Problems raised by members of the targeted audience are related to both the speed and extent to which innovations are adopted in educational settings according to the educational information.

However, there is a suspicious lack of empirical data to support the generalization and most of the studies uncovered did not provide definitive correlations between the number of problems raised and final change outcomes. References to the factor were mostly incidental or anecodotal. It was difficult to determine, for example, whether problems raised by members of the targeted audience emanated from the innovation itself or

its particular consequences on individual members of the targeted audience. It was not clear whether differences between targeted audiences or particular innovations created specific problems that affected diffusion/utilization outcomes. Hence, more research is needed before firm conclusions can be drawn about Generalization 3.6 - available educational data is insufficient for valid decision-making.

Generalization 3.7 - Successful linkage enterprise is positively related to how well available information depicts strengths and limitations of selected innovations.

Fourteen educational studies were uncovered that provided information related to Generalization 3.7 - six of the studies were categorized as empirical. The representativeness, quantity and quality of available information about selected innovations was widely supported by theoretical papers and some empirical work.

Recent reports, however, suggest that the availability of validated, research-based educational innovations with well-developed supporting materials does not necessarily guarantee adoption and utilization in educational settings. As a result, it is difficult to determine the relative influence of available information on decisions to adopt or reject innovations. Most studies failed to provide adequate controls or research designs which insured generalizable data related to the generalization. For instance, four of the five empirical studies uncovered were investigations that included only inferential support for the generalization. Studies which reported on the utility of particular sources of

information about innovations (i.e., Gulesian, 1970) generally found few correlations between these sources and subsequent adoptions. Consequently, not enough information was discovered in order to verify the applicability of Generalization 3.7.

Summary and Conclusions 3.0 The Innovation. Despite substantial research attention, it was difficult to determine how specific attributes of educational innovations affected diffusion/utilization outcomes or accounted for the relative success or failure of educational linkage agent enterprise. Two of the generalizations - "divisibility" (Generalization 3.3) and "observability" (Generalization 3.4) seemed most questionable in light of the educational research.

The complexity of an innovation (Generalization 3.5) received the most empirical support from the educational sources. It is believed that other attributes or characteristics of innovations are related to educational linkage enterprise - however, empirical investigation of these factors has not been sufficiently reported. A body of case study literature surrounds and supports most of the attributes of educational innovations. Empirical data suggest that new and unique paradigms related to the attributes of educational innovations need to be developed. However, despite these recommendations, most researchers continue to utilize the five multi-disciplinary attributes suggested by Rogers and Shoemaker (1971). There does not exist strong empirical evidence that these multi-disciplinary attributes are applicable to educational linkage enterprise. In fact, emerging educational research suggests quite the contrary - that there are unique characteristics and conditions which exist among and

between educational innovations and the educational practice setting and the members who compose these units of change. Analysis reveals that not enough information has been gathered about these characteristics and conditions of educational linkage enterprise to assure complete validity.

4.0 The Targeted Audience (Parts II and VI of the Methodology).

A review of the educational evidence related to the five multi-disciplinary research generalizations under the Targeted Audience produced widespread support for all five factors, but little empirical evidence for any of the factors. In general, educational researchers have tended to ignore certain target audience variables - size of the adopting units and administrative and decision-making structures and processes within individual schools and districts. Most of what is known about such aspects of organizational and target audience variables is derived from multi-disciplinary research traditions.

Empirical and non-empirical studies were fairly evenly divided in supporting Generalizations 4.1, 4.2 and 4.3 - however, Generalization 4.4 (participation of members of the targeted audience) and Generalization 4.5 (support of opinion leaders) were largely endorsed by studies which were categorized as non-empirical. In general, the educational evidence was less than convincing in regard to all of the generalizations. Definitive outcomes from the empirical studies were generally absent. Hence, additional empirical research is required in order to discover the role and influence of targeted audience variables on educational diffusion and utilization.

Generalization 4.1 - Successful linkage enterprise is inversely related to the number of persons within a targeted audience.

Fourteen educational studies were uncovered that provided information related to Generalization 4.1 - eight of the studies were categorized as empirical. It was difficult to determine the relatedness of the generalization due to the lack of specific research attention. Although some studies reported on the size of the district or the complexities involved in changing urban schools, not enough information was uncovered to insure the generalizability of the factor.

Research focused on the role and functions of linkage agents in relation to the number of persons within the targeted audience were not discovered. As a result, research designed to determine the relationship between linkage agents and the size of the targeted audiences seems necessary.

Generalization 4.2 - Successful linkage enterprise is inversely related to the number of administrative units (i.e., schools) within a targeted audience.

Eleven educational studies were uncovered that provided information related to Generalization 4.2 - five studies were categorized as empirical. Little educational information about Generalization 4.2 could be discerned from the sources uncovered. There were few empirical correlations reported and frequently; the case studies only described certain problems that affected the spread of innovative practices between school sites or districts.

The influence of organizational size and the number and proximity of schools to each other seems related to a number of linkage agent tasks and functions. Research needs to investigate if individual agents or teams of agents are more effective in educational settings where the size of the adopting unit can be related to the degree of influence and assistance provided and to final change outcomes. It seems reasonable to believe that a variety of demographic factors in the targeted audience are positively related to successful linkage enterprise. Unfortunately, this belief cannot be substantiated on the basis of the existing educational research evidence.

Generalization 4.3 - Successful linkage enterprise is inversely related to the number of decision-making levels within a targeted audience.

Ten educational studies were uncovered that provided information related to Generalization 4.2 - five of the studies were categorized as empirical. Changing existing practices and implementing innovative programs, practices, or products seem related to the nature and number of decision-making levels within educational bureaucracies. There is a quantity of multi-disciplinary research which suggests that organizational capacity can be scientifically studied and correlated with differences in production or "outputs." Administrative style, channels of communication, and information flow account for differences between organizations in responding to innovations and accelerating social changes.

The present investigation uncovered very little information related to either the number of decision-making levels or the particular nature of

these processes in relation to successful linkage enterprise. The general lack of both empirical and non-empirical educational research on Generalization 4.3 is somewhat puzzling. Whereas ten educational sources were uncovered related to Generalization 4.3, the need for additional research on topics identified by Chesler et al (1967), Lippitt et al (1967) and Paul (1977) seems required before any firm conclusions can be drawn about Generalization 4.3. Hence, the generalizability of the number of decision-making levels is suspect since little educational evidence was uncovered to verify its application to educational linkage tasks.

Generalization 4.4 - Successful linkage enterprise is positively related to the extent to which members of a targeted audience participate in the linkage enterprise.

Twenty-six educational studies were uncovered that provided information related to Generalization 4.4 - nine of the studies were categorized as empirical. The broad participation of individuals involved and affected by change programs was supported by all but one of the educational research sources. Participation was seen as increasing communication and feedback about selected innovations, overcoming resistance and problems of implementation and creating a sense of ownership and involvement in the proposed change.

Only Giacquinta (1973) questioned the utility of participation strategies for diffusing educational innovations. Giacquinta's objections were based on a total lack of comparative research studies and serious conceptual and methodological flaws in the research which supports participation strategies.

The present investigation discovered numerous examples of the problems identified by Giacquinta (1973). For example, the empirical research support for Generalization 4.4 represented only 35 percent of the total and was, in general, beset with numerous methodological problems that affected the validity and generalizability of the findings to other settings or to other innovations.

The lack of studies that compared the results of participation to examples of non-participation or where participation was limited instead of widespread was the most serious gap uncovered in the educational research literature. It was difficult to assert the primacy of one strategy over another when there was no evidence upon which to base these comparisons. Hence, more needs to be known about Generalization 4.4 in relationship to alternative strategies and how these diverse strategies influence final linkage outcomes.

Generalization 4.5 - Successful linkage enterprise is positively related to the extent to which opinion leaders and other influentials within a targeted audience support selected innovations.

Twenty-three educational studies were uncovered that provided information related to Generalization 4.5 - only five of the studies were categorized as empirical. The support and influence of opinion leaders is well documented in the multi-disciplinary research literature. Most models of social change include references to the social status, prestige, cosmopolitism, and the dynamics of individuals and groups in spreading and utilizing new information in complex social systems.

Much, if not all, of the educational evidence uncovered can be categorized as non-empirical case studies or papers of contention which are based on information from sociology, group work, agriculture, or mass communications. Hence, there is little empirical evidence from educational settings from which to understand how completely the support of opinion leaders is related to educational dissemination and utilization. As a result, the support of opinion leaders, while well-supported by multi-disciplinary research, is not supported by comparable research in educational settings.

Summary and Conclusions - The Targeted Audience

Results of the present investigation reveal that educational researchers have not investigated a variety of variables within the targeted audience setting in a systematic way. Instead, multi-disciplinary research sources support most of what is known about the number of persons, administrative units, and decision-making levels in relation to dissemination and utilization. The participation of members of the targeted audience and the role and support of opinion leaders rest on similar multi-disciplinary research. Comparisons between the educational research outcomes and the multi-disciplinary sources proved to be difficult. Empirical data bases are uneven and weak across all of the five generalizations.

It is believed that some, if not all, of the generalizations may relate to successful linkage enterprise. However, it was difficult to substantiate these beliefs in the absence of more empirical data and educational information.

5.0 Linkage Modus Operandi (Part VII of the Methodology).

Four interrelated factors are expressed in the multi-disciplinary generalizations under Linkage Modus Operandi - the time invested to identify opinion leaders, the extent of interpersonal communication between the linkage agent and opinion leaders, the extent of interpersonal communication between opinion leaders and others, and the amount of time invested by opinion leaders in linkage enterprise.

The importance of interpersonal communication and interpersonal sources of information was well supported by the educational evidence. In contrast, little information was uncovered related to the amount of time invested to identify opinion leaders (Generalization 5.1) or the amount of time invested by opinion leaders in linkage enterprise (Generalization 5.4). Aspects of the relative amount of time invested in relation to final change outcomes have not been reported in the educational research literature. In fact, there exists little data to argue for the primacy of one tactic over another when comparisons are made between diverse linkage agent functions. The four multi-disciplinary factors provide one organized frame of reference from which to suggest linkage agent modus operandi. However, the lack of empirical data relative to any one of a number of suggested models of linkage modus operandi prevents firm conclusions from being drawn on any of these theoretical models.

Generalization 5.1 — Successful linkage enterprise is positively related to the amount of time invested in identifying opinion leaders and other influentials within a targeted audience.

Eighteen educational studies were uncovered that provided information related to Generalization 5.1 - five studies were categorized as empirical. Eighty-three percent of the studies (N=15) supported the generalization, whereas seventeen percent of the studies (N=3) were categorized as inconclusive. Advocacy for the importance of utilizing opinion leaders in diffusion activities exists; however, little information specifically related to the amount of time invested to identify such individuals was uncovered. Implications from these findings suggest that additional research is necessary before relationships can be discovered between the time invested by linkage agents in particular tactics or organized strategies and successful linkage outcomes.

The new and emerging relationship between eduational linkage agents and school improvement projects requires much description as well as verification. Estimates as to how to best utilize linkage agent time and expertise are, at present, questions for future research to explore and answer. There is little evidence available to make such judgments and information categorized under Generalization 5.1 portrays the relatively weak empirical knowledge base on such issues.

Generalization 5.2 - Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between the person or persons responsible for the linkage enterprise and opinion leaders and other influentials within a targeted audience.

Twenty-one educational studies were uncovered that provided informa-

tion related to Generalization 5.2 - ten of the studies were categorized as empirical. Empirical support for this generalization was strong, although it was noted that the importance of interpersonal communication and the frequency with which it occurs were widely reported and related to successful linkage enterprise. Interpersonal channels of communication were viewed as important at all stages of the innovation-decision process, and particularly in the early phases where interest and awareness functions are most evident. Printed materials, lectures, in-service workshops conducted by outside consultants, demonstrations, summer workshops, or multi-media presentations were not as strongly related to successful linkage enterprise when compared with interpersonal communication and face to-face dynamics.

Hence, Generalization 5.2 received a quantity of empirical and non-empirical support from the educational sources uncovered. Further research might determine more efficient and organized methods of optimizing interpersonal channels of communication across a variety of educational settings, and particularly, with differences in targeted audience size and location. In this way, more could be learned about organizational and demographic variables in relation to communication patterns and decisions to adopt or reject educational innovations.

Generalization 5.3 - Successful linkage enterprise is positively related to the extent to which interpersonal channels of communication are established between opinion leaders and other influentials within a targeted audience on the one hand, and other

members of the targeted audience on the other hand.

Twelve educational studies were uncovered that provided information related to Generalization 5.3 - five studies were categorized as empirical. The logic and appeal of utilizing identified opinion leaders to assist in diffusing innovative practices, programs or products derive from a body of research in sociology, anthropology and mass communications (see Katz and Lazarsfeld, 1955 and Katz, 1957 for example). In this view, knowledge of innovations is spread through interpersonal communication and interaction between opinion leaders and other members of a social system. Opinion leaders act as mediators or interpreters of inputs from outside the organization and exert powerful influences on the behavior of potential adopters.

While interpersonal communication was prominently featured in a number of educational sources, little evidence was uncovered related to the importance of interpersonal communication between opinion leaders and other members of the targeted audience. White (1968) provided the most specific and empirical source uncovered. Findings from White (1968) suggest a number of directions for future research to explore. However, it was disappointing to discover that few researchers have pursued such inquiries. As a result, Generalization 5.3 remains a question which requires further investigation before firm conclusions can be drawn.

Generalization 5.4 - Successful linkage enterprise is positively related to the amount of time invested in linkage enterprise by opinion leaders and other influen-

tials within a targeted audience.

Four educational studies were uncovered that provided information related to Generalization 5.4 - two of the studies were categorized as empirical. Most of the support for this generalization was inferential and the number of educational studies uncovered provides an example of the work that needs to be done in order to research this factor. Not much has been reported about relationships between the amount of time invested by opinion leaders and successful linkage enterprise. As a result, Generalization 5.4 remains a question for further educational research to explore.

Summary and Conclusions - 5.0 Linkage Modus Operandi

Description and conceptualization characterize most of what is presently known about variables and processes associated with educational linkage modus operandi. In other instances, research from a variety of multi-disciplinary research traditions comprises the bulk of empirical evidence and support and is routinely used to explain educational diffusion/utilization phenomena.

Empirical data does not exist to support most of theoretical models of educational linkage modus operandi. Reports of successful linkage agent strategies and tactics have generally suffered from a lack of specificity and research designs that are not designed to test the efficacy of the theoretical constructs.

Verification of the four multi-disciplinary factors related to linkage modus operandi was not possible since the educational data was not sufficient for comparisons. It is believed that additional research is

necessary before a scientific understanding of educational linkage modus operandi is possible.

6.0 Outcomes (Part VIII and IX of the Methodology).

The need for the evaluation of both effects and linkage modus operandi was well supported in the educational research sources. It was pointed out, however, that most evaluations of linkage agent programs or school improvement projects fail to provide generalizable data.

Four factors were gleaned from the educational information that account for the poor quality and lack of generalizability of most educational evaluations:

(1) change objectives are poorly defined making correlations between treatment and effects difficult;

(2) evaluation and measurement tools are poorly developed;

(3) resources and personnel for conducting rigorous evaluations are not usually available;

(4) variations between educational practice settings and differences between change projects make the acquisition of generalizable data a complex task.

The effects of innovation adoption on targeted audiences is not well documented. Evaluation of diverse linkage agent modus operandi is confined to the case study literature. As a consequence, educational researchers lack a systematic and integrated body of findings from which to assess the consequences of particular changes or the strategies and tactics utilized to accomplish these changes. Hence, successful linkage enterprise continues as more of an art and less of a science.

Generalization 6.1 - Successful linkage enterprise is positively related to systematic evaluation of effects of selected innovations upon targeted audiences.

Twenty-four educational studies were uncovered that provided information related to Generalization 6.1 - only four of the studies were categorized as empirical. A substantial body of opinion supported the generalization. At the same time, most sources observed that the systematic evaluation of effects of selected innovations upon targeted audiences is rarely performed, and most often, is not generalizable to other settings.

Sizeable gains could be made through more systematic evaluations of linkage enterprise and how the effects of particular diffusion/utilization decisions within the targeted audience are related to variables that can be manipulated and controlled. Paisley (1972) pointed out that a "natural" diffusion process and network exists in most educational settings. However, significant differences were noted among these natural diffusion channels that accounted for significant variations in resource utilization between individual schools and districts. Hence, more needs to be known about educational diffusion and utilization in order to compensate for differences between settings as noted by Paisley (1972).

Generalization 6.2 - Successful linkage enterprise is positively related to systematic evaluation of linkage modus operandi utilized.

Thirteen educational studies were uncovered that provided information related to Generalization 6.2 - only one study was categorized as empirical. Not enough evidence was uncovered about Generalization 6.2 and

studies by Cates (1978), Hood and Cates (1978) and Berman et al (1975) discovered similar results in their reviews of the educational change literature. Most models of educational dissemination and utilization (i.e, McCutcheon and Sanders, 1974; Kirkpatrick, 1972; Wolf-Welsh, 1979) specify evaluation cycles designed to provide information on modus operandi matters. In addition, evaluations of school improvement assistance programs and educational linkage agent pilot projects are routine aspects of proposal funding and approval.

It is surprising, then, to discover that so little generalizable data has been produced and reported from these evaluations. Information uncovered in 5.0 Linkage Modus Operandi reveals that little progress has been made in verifying variables and processes associated with successful linkage modus operandi.

Educational information is not available in order to determine the relatedness of Generalization 6.2. While the acquisition of such evaluation data is widely advocated and described, there is not an integrated and parsimonious framework upon which to assess the impact of diverse linkage modus operandi on targeted audiences.

Summary and Conclusions - 6.0 Outcomes

The absence of empirical and generalizable evaluation data on the effects of selected innovations upon targeted audiences and the utility of diverse linkage modus operandi utilized represents a significant gap in educational linkage know-how. Without such data, chances for the development of effective linkage systems between the federal, state and local agencies responsible for educational dissemination and utilization are

slim.

Resources and personnel are needed at all levels in order to assure that required evaluations are conducted properly. In addition, more rigorous designs are required and variables need more precise specification before confidence can be placed in the validity and generalizability of the results.

The Findings in Review.

In Chapter V, the background and nature of the problem were presented. Results of the investigation on each of the twenty-six multi-disciplinary research generalizations were reviewed and analyzed. Recommendations for further research were outlined for each of the generalizations as well as the five overarching theoretical linkage constructs from which the generalizations were derived.

An effort was made to compare the findings of completed educational research to the multi-disciplinary generalizations in a way that would reveal similarities, differences and needed research between the two sets of information. It was believed that the verification of selected linkage generalizations, derived from a variety of multi-disciplinary research traditions, would be a logical product of such a method of comparison. While the quantity of educational information prevented the identification of every study related to each of the twenty-six generalizations, a representative sample of completed educational research was uncovered for each of the generalizations.

Three central questions guided the interpretation of data reported in this chapter:

1. Are there linkage generalizations, based upon research completed in disciplines other than education, which can be legitimately utilized within varied educational contexts?
2. Are there linkage generalizations, based upon research completed in disciplines other than education, which should not be utilized within varied educational contexts?
3. Are there linkage generalizations, based upon research completed in disciplines other than education, which should be - but are not being - utilized within varied educational contexts?

Despite every reasonable effort during the investigation and analyses of the educational information, conclusive answers to these three questions are not possible. One central problem accounts for this situation: there is not enough empirical research data from a variety of educational contexts.

Since the 1960's, a number of researchers (i.e., Havelock, 1969; Giacquinta, 1973; Piele, 1975; Cates, 1978; and Wolf, 1980) have reported on the dearth of experimental research on educational diffusion and utilization topics. In spite of these reports, most researchers continue to base their investigations on research designs that are not capable of generating valid data or continue to utilize any number of multi-disciplinary diffusion research generalizations that are questionable in their application to educational settings. Theoretical conceptualizations of educational change and the role and functions of educational linkage agents are as numerous as the researchers who are interested in such matters. Hood and Cates (1978) pointed out that none of these theoretical models is based on empirical evidence. Few tests of these models are

attempted or reported in the research literature.

The present investigation was based on over ten years of developmental work by Wolf. A theoretical linkage construct developed by Wolf (1974) was utilized by Welsh (1976) and Wolf (1979) to devise a systematized, operationalized and standardized linkage tool - the Wolf-Welsh Linkage Methodology (1979). Field tests of the tool were promising. However, questions still remained about the multi-disciplinary research base of the methodology. A comparison of information reported from educational contexts against the multi-disciplinary generalizations seemed required in order to test the ubiquity of the research utilized to construct the Wolf-Welsh Linkage Methodology (1979).

However, valid comparisons were not possible since so little empirical research exists. While the multi-disciplinary research utilized by Wolf and Welsh appears to be generally well-supported in the educational diffusion literature, the overall quality of this tradition of research is still in question. Some aspects of the methodology are more suspect than others (i.e., the attributes of the innovation), however.

The present investigation established a base of knowledge about what educational researchers have reported about twenty-six major diffusion generalizations related to successful linkage enterprise. While no definitive conclusions can be offered regarding these generalizations, the synthesis and organization of the educational information is a valuable step in advancing educational linkage know-how. It is believed that few, if any, available linkage tools have been as systematically researched and tested as the Wolf-Welsh Linkage Methodology (1979).

The Wolf-Welsh Linkage Methodology is based on a number of diffusion/

utilization assumptions that are central to what completed educational research studies have reported in recent years. Some areas have less support than others; however, the educational data indicated that the variables and processes of Wolf's dissemination "recipe" were most representative about what is presently known about successful linkage enterprise. The irony of such educational support resides in the qualifications which, of necessity, must be placed against the overall quality of the educational diffusion research literature. While these qualifications do not necessarily undermine the logical utility of the Wolf-Welsh Linkage Methodology to educational linkage tasks, such qualifications place distinct limitations on a complete verification of the research base of the research base of the Methodology.

From this perspective, a number of research activities seem required:

(1) specific educational diffusion/utilization assumptions need to be addressed through a series of rigorous empirical studies conducted in a variety of educational settings;

(2) empirical data and research suggested from past investigations need to be identified and verified through replication and additional research;

(3) more reliable tools and methods of evaluation need to be developed and integrated into the usual practice and policy of linkage agent projects;

(4) conceptualizations of educational linkage agents and major theoretical models of educational linkage need to be thoroughly field-tested and reexamined in light of data obtained;

(5) efforts need to be continued to synthesize and organize generalizable results into useful frameworks for the development of linkage agent training programs and change projects (i.e., see Piele, 1975; Paul, 1977; Cates, 1978; and Emrick and Peterson, 1978).

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APPENDIX

THE WELSH METHODOLOGY (1976)

The following are steps outlined by Welsh (1976) in describing his methodology.

Purpose: To meet needs through the dissemination of products

Case I: The dissemination if working for a product developer (a special case--the disseminator is the product developer)

Case II: The disseminator is working as an independent change agent (i.e., his remuneration would come from something like a university salary; dissemination is not his only major concern; rather, one of a number of interests)

Case III: The disseminator is working for a funded agency whose function is to disseminate products (for example, the Far West Laboratory for Educational Research & Development)

Case IV: The disseminator is working for a consumer or group of consumers (i.e., a school system)

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1. Negotiate a contract with a product developer interested in dissemination.

   A. Determine the person or group whose decision-making authority is needed for the dissemination effort.

   B. Ask to negotiate a contract with the contractor(s). If necessary, deal with someone authorized to represent them.

   C. Be sure that decisions made about the contract are made using the person or group's normal decision-making procedure.

   D. Identify the product to be disseminated.

   E. Identify the resources available for the dissemination effort.

      1. Develop at least a general plan, within the methodology but specific to the product, that can be done using relatively low resources (for example, for $1000 or less).

         a. Decide which steps are the most crucial to follow closely, even given low resources.

b. Decide which steps can be eliminated with the least possible damage, or which can be given very low resources.

c. Devise the product-specific plan according to the revised submethodology.

2. Develop at least a general plan, within the methodology but specific to the product, that can be done using a middle level of resources (for example, between $1000 and $10,000).

a. Decide whether any of the steps can be accomplished using few resources and which require considerable resources, for a plan of middle-level effectiveness. Allocate the resources, in a very general way, accordingly.

b. Devise the product-specific plan according to the revised submethodology.

3. Develop at least a general plan, within the methodology but specific to the product, that can be done given a relatively high level of resources. (For example, over $10,000). Each step should be given at least adequate resources in this plan.

F. Determine what will be satisfactory to the product developer with regard to consumers adoption of the product.

1. If the product is complex, identify its component parts.

2. Determine whether any of these must be adopted without significant adaptation in order that the product developer be satisfied.

3. Determine at least some reasonable possible adaptations and check their acceptability with the product developer.

G. Prepare the contract for the product developer's approval. The contract should specify those things determined in the previous three steps: (1) the product to be disseminated; (2) the resources available; and (3) the criteria for success.

II. Plan the implementation of the rest of the methodology.

A. Allocate the resources according to the percentages on the resource allocation chart.

B. Examine the resulting allocation in light of the nature of the product and the dissemination effort, and make adjustments if necessary.

C. Be prepared to shift the resources allocation as the dissemination progresses. The allocation should be given at least some consideration after each major step is completed.

III. Have the product developer design--or adapt, if the product is already designed--the product to be as amenable to dissemination as possible, without changing the character of the product.

A. Determine the resources available for this step.

B. Make an initial judgment as to what general populations will benefit from the adoption of the product.

1. Implement a needs analysis methodology

a. The Coffing-Hutchinson methodology is recommended, with the product developer as the decision-maker.

C. Make the product as compatible with the potential adopter's values, culture, and/or traditions as possible.

1. Determine whether or not the product is by nature adaptable to a variety of traditions, values, practices, etc. If it is not, go to Step III. D.

2. Determine the likely effect of the product on the consumer's values, traditions or practices.

a. If resources permit, conduct a small-scale field test of the product, using if possible a small random sample of the group or one of the groups, determined in Step III. B. This is by far the best procedure, since side effects are often very important and frequently quite difficult to predict.

(1) As far as possible, before the field test, make that feature of the product that meets the need the only thing about that product that is different from what the target group is accustomed to or familiar with. For example, suppose a tailored testing program is the product of concern. The tailored tests should be given under the same conditions, by the same persons, in the same classrooms, and graded by the teachers (if that is customary). All these things reduce the threat that it is something somehow "alien." A programmed instruction unit should be given in the regular classroom, administered if possible by the regular classroom teacher,

etc. Again, only what must be different to insure that the need be met should be different.

b. If resources are insufficient for even a small field test, the views of people whose systems, practices, etc., will likely be affected should be solicited. (e.g., if it will affect the schools, some teachers, administrators, and students should be given the opportunity to react to the product.)

c. If resources are extremely small, available literature on the specific values of the group to be targeted, or the opinions of some experts, will be of some help. In other cases, they may be used as supplements to a and b above.

3. If few common values/traditions/practices are common, or if resources were not sufficient to determine them, make the product as adaptable to a variety of situations as possible.

D. Keep the cost of the product as low as possible.

1. If product costs nothing or almost nothing (e.g., a research report advocating some variety of behavior change), move to Step III. E.

2. Break the product down into component parts if possible.

3. Determine which of the components are essential to the product if it is to accomplish the purpose for which it was designed.

4. Eliminate those components found to be non-essential in Step 3.

5. Continue to break down the components until it is relatively easy to determine the lowest possible cost for each. The total will then be the lowest possible cost for the product.

6. Document cost information for use in Step VIII.

E. Reduce the complexity of the product as much as possible.

1. Steps III. D. 2. through III. D. 4. will have yielded components of the product. If the components are broken down as far as possible, go to Step 3.

2. Break down the components into their most basic subcomponents.

3. If necessary, provide explanation of the final lists of components of the product.

4. Document complexity information for use in Step VIII.

F. Make the product "divisible" so that it can be tried initially on a small scale.

1. Determine whether the product is divisible or can be made divisible without sacrificing its ability to accomplish its purpose. It if is not, or cannot be made divisible, go to Step III. G.

2. Determine how the product can be tried on a limited basis.

a. Determine whether only part of the product need be tried.

b. Determine whether only a part of the adopting population (given that it is made up of more than one person) needs to try the product to give it a fair trial.

c. Document all possible ways the product can be made divisible for use in Step VIII.

G. Make the product observable, if possible, so that a potential adopter can see it in operation before he makes his decision.

1. Determine whether any institutions already use the product.

2. Determine whether the product developer or the disseminator can demonstrate the product.

3. Document observability for use in Step VIII.

H. Devise appropriate support services which the adopter may avail himself of after adoption of the product.

1. Determine the resources available to provide support services.

2. Determine potential difficulties adopters can encounter when using the product.

3. Determine which of these can be eliminated, or at least reduced, by providing support services to the adopter.

4. Plan specifically support services to reduce problems identified in Step 3 in accordance with available resources.

I. If possible, try to design/adapt the product to make its positive effects as visible as possible, as quickly as possible, and/or suggest possible measurement techniques to determine the effect.

1. Before the first successful adoption of the product:

a. Determine likely early indicators that the product is at least beginning to meet the need it is supposed to.

(1) If possible, draw on experience with similar products adopted previously.

(2) If (1) is not possible, a thorough familiarity with the product and the target group should allow for a reasonable estimate as to what should be happening in the early stages if the process is proceeding as it should. For example, in the case of the Clinic, faculty satisfaction is not empirical proof of the value of the process; it very likely is an early indicator of success, however.

b. Devise measurement techniques and tools for these criteria and rationales for them.

c. Be prepared to train the adopter(s) of the product in the use of these tools and techniques.

2. Document the adoption and implementation processes, as much as resources permit, with several persons or groups.

3. After the first successful adoption of the product:

a. Use the documentation of successful adoptions to determine criteria for early indications of success.

b. Devise measurement techniques and tools for these criteria, along with appropriate rationale for them.

c. Be prepared to train subsequent adopter(s) of the product in the use of these tools and techniques.

IV. Develop a plan to create as broad an awareness of the product as possible.

A. Identify the resources available for this step.

B. Identify broad groups of persons or institutions likely to have some reasonable interest in the product.

C. Identify media appropriate for communication with these broad groups. The criteria for selection could be:

1. Number of persons or groups that can be reached.

2. Likelihood that these persons or groups will be interested in the product.

3. Credibility of the media.

4. Cost of using the media.

D. Devise general descriptions of the product for use in these media that make at least some mention of some of the product attributes discussed in major process IV, (if the product has those attributes).

V. Conduct a needs analysis to identify potential target groups.

A. The more sophisticated procedures contained in the Coffing-Hutchinson Needs Analysis Methodology are recommended.

VI. Among those persons or groups identified in Step V, identify those most likely to receive the product most favorably.

A. Identify, as far as possible, those subgroups on whom the product would have seriously detrimental side effects, and leave them out of the dissemination efforts.

1. If at all possible, conduct at least a small field test of the product. This is strongly recommended, as harmful side effects are often very difficult to anticipate.

a. If the product is made divisible-as is suggested in Step IV--resources for a field test may not have to be large at all.

2. If resources are smaller, judgement will have to be made on indirect evidence.

a. Demonstrate if possible (or explain, if not) the product to as many in the population who would be affected by the product and obtain their reaction.

b. Demonstrate if possible (or explain) the product to a few experts in the area and obtain their reaction.

c. Data from Step III. B. may well be helpful here.

B. Identify those groups for whom the product would have the greatest relative advantage over what is currently being used to fill the need.

1. Identify groups that have nothing currently meeting the need. These would be first priority on the list.

2. Identify other groups for which the product represents an increased relative advantage. Components of relative advantage include: greater effectiveness, more efficiency, lower cost, higher compatibility with the system. There are no doubt many others.

C. Among the remaining populations, identify subgroups for whom the product fills a relatively high-priority need.

VII. Identify, among the designated potential adopters, those most likely to react favorably to the product and focus communication on them.

A. Determine the resources available for this step.

B. Identify, within the population, the target audiences (on whom the product is designed to have an effect), the decision audiences (who decide on adoption/rejection) and the adoption audiences (who actually use the innovation).

C. Determine those in the decision audiences who are the early adopters.

1. If resources are relatively large:

a. Identify products used by members of the population that are similar to the product to be disseminated.

b. Determine those in the population who have a record of early adoption of those products.

(1) Examine available records of the adoption of those products.

(2) Talk with those persons who use those products.

(3) Talk with others connected with the adoption of these products.

(4) Talk with the developers of those products.

2. If resources are relatively small, or if no similar products are in use in the population, early adopters can quite often be identified as having the following characteristics: Higher social status (e.g., education level,

salary, "reputation"); size of adoption unit; general innovative behavior (with a variety of products); and relatively extensive use of mass media. The following steps are recommended as being possibly useful:

a. Identify potential adopters with relatively higher social status.

b. Identify potential adopters with larger size units.

c. Identify potential adopters whose general adoptive behavior shows a trend toward innovation.

d. Identify potential adopters who appear to make relatively more use of mass media. The above may not always be practical or useful all the time, but at this point it appears that they often will be.

D. Determine, as far as possible, the opinion leaders in the population of concern.

1. If resources are relatively large, opinion leadership may be measured by using certain sociometric devices (e.g., questionnaires that ask, "name the three colleagues of whom you would most likely ask advice about (whatever the product is)."

2. If resources are relatively small:

a. More crude measures may be used, e.g., "reputation" or "prestige" as judged by local experts. Opinion leaders tend to have higher social status.

b. Opinion leaders tend to be more innovative. Identification of those generally innovative members of the group (as may have been accomplished in Step VI) will lead to the identification of many opinion leaders.

E. Prioritize the final list of persons/groups to be contacted. Criteria should include innovativeness and/or degree of opinion leadership.

VIII. Make contact with those in the final prioritized list generated in Step VII.

A. Prepare for each specific meeting.

1. Learn as much as possible about the specific client or client group in terms of:

a. The purpose and basic operations of the institution.

b. The resources of the institution.

c. Level of sophistication (especially with regard to the product.

d. Most likely apprehensions about adoption of the product (e.g., is there hard evidence of the usefulness of the product; how will adoption affect the status of the adopters; how much will it cost; how will the product fit with the particular institution, etc.).

2. Be sure to be just as knowledgeable about the product as possible, especially including:

a. Those aspects of the product determined in Step III.

b. How the product would fit, very specifically, into he particular institution to be contacted.

B. Provide the client with ample opportunity to discuss his institution. This will (1) give the disseminator more information about the client, and (2) demonstrate client orientation which has been demonstrated to be directly related to success in dissemination.

C. Discuss your role in disseminating the product.

D. Explain the product fully, and describe how it will meet the client's needs.

1. Remain somewhat low-key in the presentation, i.e., avoid the hard-sell or oversell. This is particularly important in the academic community.

2. Discuss the nature and purpose of the product, and how you believe it could meet one or more of the client's needs.

3. Illustrate your perception of what the total impact on the client's system will be, describing both possible and negative effects.

4. Demonstrate if possible--or explain, if not--the characteristics of the product that were determined or developed in Step IV.

a. The cost of the product.

b. How the product can be observed in use (if it can).

c. How the product can be tried on a limited basis (if it can).

d. Its compatibility, i.e., how well it fits the client's system or institution.

e. The support services available for use if the product is adopted.

5. If the decision-maker's reaction to the product is favorable, encourage him/her to give other persons/groups at least some input into the final decision.

a. Offer to make presentations to the various persons or groups preferably separate, so the presentation can be more specifically tailored.

6. If the decision-maker(s) refuse the offer, proceed to Step IX. Otherwise, go to the next step.

7. Presentations to other persons and/or groups should be made using the same procedures as outlined for the decision-makers.

IX. If resources for this step remain, implement the "2-step model," i.e., help the opinion leaders disseminate the product to others in the population.

A. Determine whether the opinion leader wants to help in the dissemination effort.

B. Determine whether the opinion leader is to be trusted with the resources available for this step. If not, go to Step X.

C. Determine how much and what kinds of resources the opinion leader needs.

D. Make the resources available to the opinion leader.

X. Evaluate the results of the adoption/rejection.

A. The Fortune-Hutchinson evaluation methodology is recommended.

XI. Proceed through Steps III-X until the product is completely disseminated, or until resources run out.

XII. Evaluate the success of the methodology and revise where appropriate.

A. Determine the extent to which the product was successfully disseminated. (Several criteria can be used, depending partially on the nature of the dissemination effort).

1. Cost-benefit criteria.

a. Determine resources spent in disseminating the product.

b. Determine the number of people or groups who have adopted the product.

c. Compare a and b.

2. Extent to which the product is disseminated.

a. Determine the number of possible adopters contacted.

b. Determine the number of people/groups adopting.

c. Compare a and b. (This can be a problem. The nature of innovation adoption is such that it is slow at first, then rapidly accelerating, and finally slowing down again. Diffusion of any innovation can take considerable time, making evaluation of the effort difficult.)

3. Extent to which needs are met.

4. A combination of the above, or some other criteria agreeable both to the disseminator and product developer.

Wolf-Welsh Linkage Methodology (1979)

I. Attributes of Person Apt to Use the Linkage Methodology effectively

A. Prior experience of person.

1. Person has engaged in successful linkage enterprise at least once, preferably twice.

2. Person's professional background and the professional background of the typical member of the targeted audience are reasonably compatible.

B. Person is able to devote at least one day (preferably two) per week to the linkage enterprise.

C. Person can be counted upon to deliver promised services on time.

D. Person either has been trained to do the following work or is accustomed to contracting with specialists for work desired.

1. Assess needs of targeted audiences.

2. Survey literature for various reasons.

3. Ascertain demographic characteristics and attitudes of targeted audiences.

4. Conceptualize and then expedite diffusion/utilization strategies and tactics.

5. Conceptualize and then expedite evaluation strategies and tactics.

6. Prepare coherent project reports.

II. Identification of a Targeted Audience's Needs to Modify Some Aspect or Aspects of Professional Practice

A. Define parameters of a targeted audience.

1. Specify members of a targeted audience (i.e., all persons in two elementary schools, or, special education personnel in a large city).

2. Clarify roles of persons within the targeted audience (i.e., students, teachers, supervisors, administrators, etc.).

B. Ascertain needs of the targeted audience to modify practice.

1. Examine local, state, and federal education agency documents for policy shifts, expansion, or contraction.

2. Conduct surveys of various members of the targeted audience (use a packaged needs analysis methodology if time permits).

3. Compare practices of targeted audience with practices of other similar groups.

4. Examine available test results.

5. Examine available demographic data (i.e., population trends) which pertain to the targeted audience.

C. List and prioritize needs of targeted audience.

1. Prepare a list of the identified needs.

2. Distribute the list to various members of the targeted audience for the purpose of determining their priorities (repeat as necessary until a clear picture of priorities unfolds).

3. Prioritize the list on the basis of responses received.

D. Clarify who will participate in the final selection of the specific need or needs to be addressed (i.e., a committee, all involved persons, etc.).

E. Use the following criteria to facilitate selection of the specific need or needs to be addressed.

1. Resources required to meet the need or needs.
2. Time required to meet the need or needs.
3. Positive and negative consequences of meeting the need or needs.

NOTE: If a need of a well-defined targeted audience is generally known, Step I should be by-passed.

IV. Selection of Practices and/or Products Apt to Meet Identified Target Audience's Needs

A. Distribute the prepared list of practices and/or products to various members of the targeted audience for the purpose of determining their priorities (repeat as necessary until a clear picture of priorities unfolds).

B. Prioritize the list on the basis of responses received.

C. Clarify who will participate in the final selection of the practices and/or products.

D. Use the following criteria to facilitate selection of the specific practices and/or products.

1. Resources required to effectively utilize the practices and/or products.

2. Time required to effectively implement the practices and/or products.

3. Positive and negative consequences of implementing the practices and/or products.

NOTE: If a specific practice and/or product is known which probably will meet the need or needs identified, Step III should be by-passed.

V. Modification of Practices and/or Products Selected to Meet Identified Needs of Targeted Audience

A. Ascertain the extent to which selected practices and/or products are compatible with generally accepted professional practices of the target audience members.

1. Compatibility (i.e., up-dating science instructional resources) is a positive indicator.

2. Incompatibility (i.e., offering-for the first time--junior high school students an elective sex education class) indicates further action must be contemplated.

a. Review specifics of the selected practices and/or products for the purpose of isolating troublesome elements.

b. Delete troublesome elements if possible.

c. If troublesome elements cannot be deleted, confront the sources of controversy and either overcome them or neutralize them.

d. discontinue the attempt to modify professional practice, using the selected practices and/or products, if the controversy persists in force.

B. Divide the selected practices and/or products into their most basic elements.

1. Make plans to introduce the selections either piecemeal or in toto.

2. Make plans to introduce the selections as a pilot undertaking or in toto.

3. Prepare cost estimates for implementing the various options suggested in Steps VB1 and BV2 above.

C. Expedite whatever additional adaptations of the selections seem appropriate to enhance the probability of modifying the specified professional practices.

VI. Determination of Demographic Characteristics and Certain Attitudes (Toward the plan to modify some aspect or aspects of professional practice) of the Targeted Audience

A. Survey members of the targeted audience to ascertain their prior history of professional self-renewal.

1. Identify those persons (self-renewers) who routinely modify their professional practice.

2. Identify those persons (entrenchers) who seldom modify their professional practice.

B. Use an uncomplicated sociometric survey technique (many options are available) to ascertain who are the "influentials" and who are the "isolates" within the targeted audience.

1. Identify the influentials.

2. Identify the isolates.

C. Interview a sample of the identified self-renewers and the influentials to determine their respective attitudes toward the practices and/or products selected to meet specified needs of the targeted audience.

1. Affirmation is a positive indicator.

2. Either mixed reactions or opposition indicates further action must be contemplated.

a. Review specifics of the interviews completed to isolate the sources of controversy.

b. Eliminate controversial aspects of the implementation undertaking if possible.

c. If controversial aspects cannot be eliminated, confront the sources of controversy and either overcome them or neutralize them.

d. Discontinue the attempt to modify professional practice, using the selected practices and/or products, if the controversy persists in force.

D. There is no need to invest either time or resources interacting with persons identified as entrenchers or isolates at this point in the implementation process.

VII. Conceptualization and Implementation of Strategies and Tactics Intended to Incorporate Designated Practices and/or Products Within the Professional Practice of the Targeted Audience

A. Conceptualize a strategy (with appropriate tactics) which meets five conditions.

1. The strategy is geared primarily to the enterprise of persons identified as self-renewers and influentials.

2. The strategy involves two steps: Step one focuses upon self-renewers and influentials; step two utilizes these persons to influence others in the targeted audience.

3. The strategy makes maximum use of interpersonal (preferably face-to-face and two-way) channels of communication.

4. The strategy is participative in that all persons who are to be affected by the modifications in practice participate in making decisions about the undertaking.

5. The strategy incorporates a time line which projects the realization of specified aspirations.

B. Offer the conceptualized strategy (with appropriate tactics) to selected persons identified as self-renewers and influentials for their critical review, and then modify it on the basis of feedback provided.

C. Implement the strategy (with appropriate tactics).

1. Expedite step one of the two-step plan.

a. Utilize varied interpersonal channels of communication to introduce the selected practices and/or products to

the previously identified self-renewers and influentials.

b. Work closely with the self-renewers and influentials until a core of them has modified their professional practice as desired.

c. Recruit from the core of successful persons a small number who are willing to become involved in the process of generalizing the modifications in practice to other persons within the targeted audience.

2. Expedite step two of the two-step plan.

a. Utilize varied interpersonal channels of communication to share desired modifications in the practice of the recruited self-renewers and influentials with other members of the targeted audience.

b. Work closely with the recruited self-renewers and influentials during their attempts to convince selected peers to modify practice as desired.

c. Continue the process of interaction until a substantial core of the targeted audience has modified professional practice as desired.

VIII. Part One. Evaluation of the Impact of the Designated Practices and/or Products Upon the Professional Practice of the Targeted Audience

VIII. Part Two. Evaluation of the Efficacy of Steps I through VII to Meet Needs through the Modification of Some Aspects of the Professional Practice of a Targeted Audience

A. Conceptualize evaluation plans which meet six conditions.

1. The plans make provision for formative data acquisition at regular intervals throughout the implementation undertaking.
2. The plans make provision for summative data acquisition.
3. The plans can be expedited within the framework of available resources.
4. The plans make provision for the preparation of reports which can be understood by persons responsible for decision-making.
5. The plans are set forth so clearly that a valid independent replication of them would be conceivable.
6. The plans take into account standard reliability and validity concerns associated with gathering, analyzing, and reporting consequences of data.

B. Offer the conceptualized evaluation plans to at least one evaluation specialist for his or her critical review, and then modify the plans on the basis of feedback provided.

C. Highlight four consequences of the selected practices and/or products upon the professional practice of the targeted audience

when expediting the revised plans.

1. The number of persons who could have and the number of persons who actually did modify their professional practice as desired.
    a. Characteristics of the set of persons who opted to modify their practice as desired.
    b. Characteristics of the set of persons who opted not to modify their practice.
    c. Similarities and differences between the two sets of persons.
2. Perspectives, derived from the "adopting" set of persons, pertaining to whether or not their needs were met.
3. Perspectives, derived from the "adopting" set of person, pertaining to positive and negative effects of the implementations upon their professional practice.
4. Relationships between resource consumption and time allocation on the one hand and the utilization of desired practices and/or products on the other.

D. Highlight the extent to which Steps I through VII of the linkage methodology met needs of a targeted audience when expediting the revised plans.

1. Perspectives, derived from the person or persons who used the tool, pertaining to the viability of Steps I through VII.
    a. Additional steps or sub-steps needed.
    b. Steps or sub-steps not needed.

2. Perspectives, derived from the person or persons who used the tool, pertaining to the precision of language contained in Steps I through VII.

3. Perspectives, derived from the person or persons who used the tool, pertaining to the precision of suggested activities contained in Steps I through VII.

IX. Recommendations for Improving upon the Linkage Methodology (Steps I through VIII) on the Basis of Evaluation Results

A. Set forth recommendations for increasing the precision of language contained in Step I through Step VIII of the tool.

B. Set forth recommendations for increasing the precision of suggested actions contained in Step I through Step VIII of the tool.

C. Set forth recommendations for adding steps or sub-steps to fill gaps recognized between Step I and Step VIII of the tool.

D. Set forth recommendations for deleting steps or sub-steps deemed unnecessary between Step I and Step VIII of the tool.